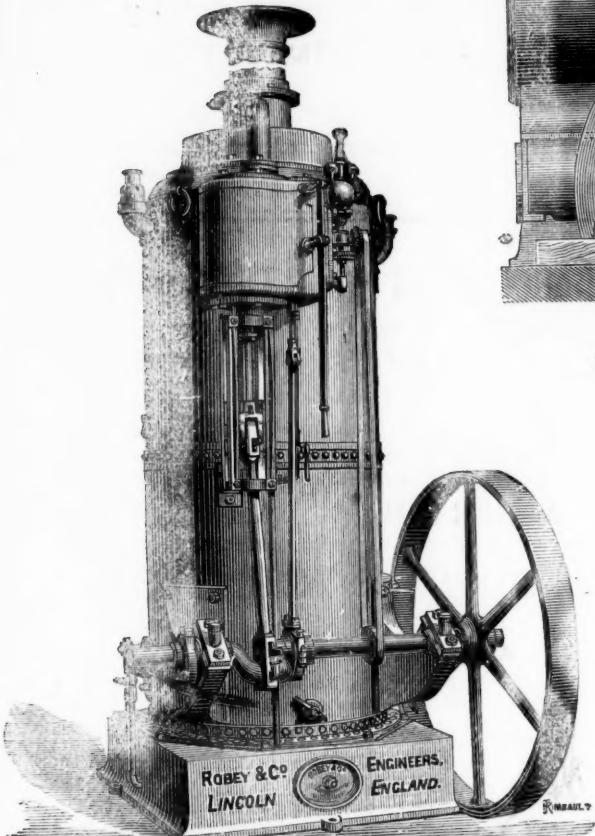
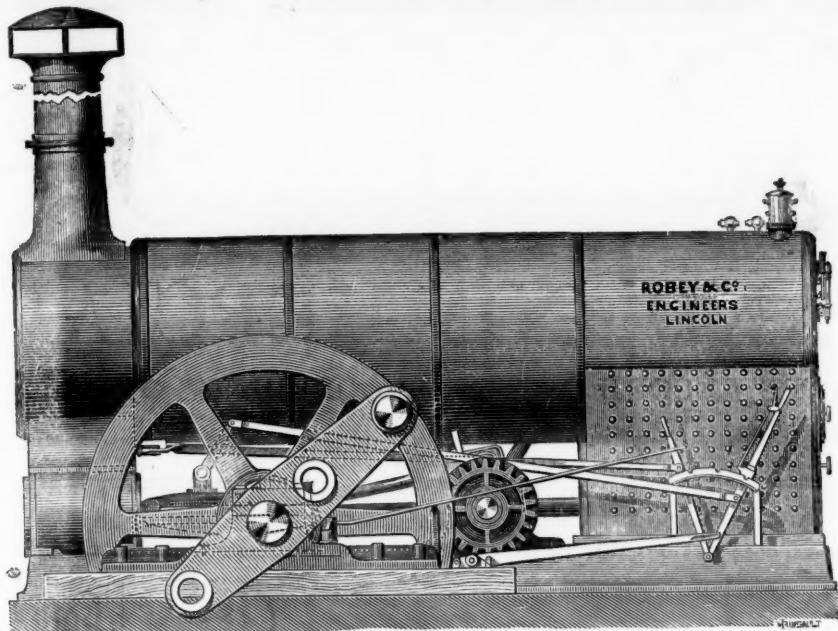


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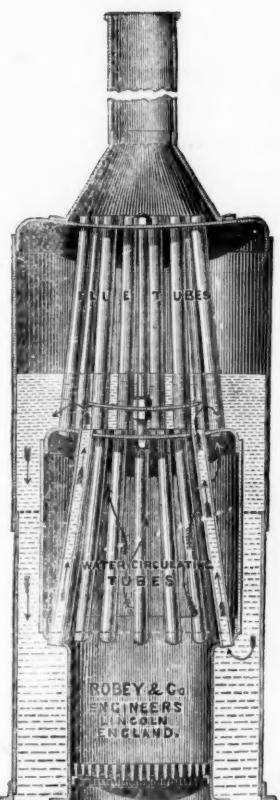
The Illustrations show one of Robey and Co.'s Improved Vertical Engines. All these Engines are supplied with R. and Co.'s New Patent Boiler, as per section illustrated, which has, among others, the following advantages over all Vertical Boilers yet introduced:—

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[Estimates and further information will be prepared on receipt of the necessary particulars].

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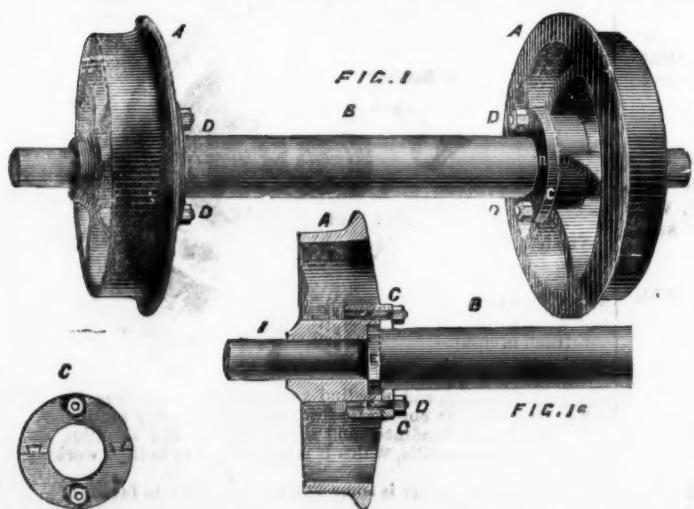
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CRUCIBLE CAST STEEL CASTINGS,
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A New Patent Method of Fitting up Wheels and Axles.

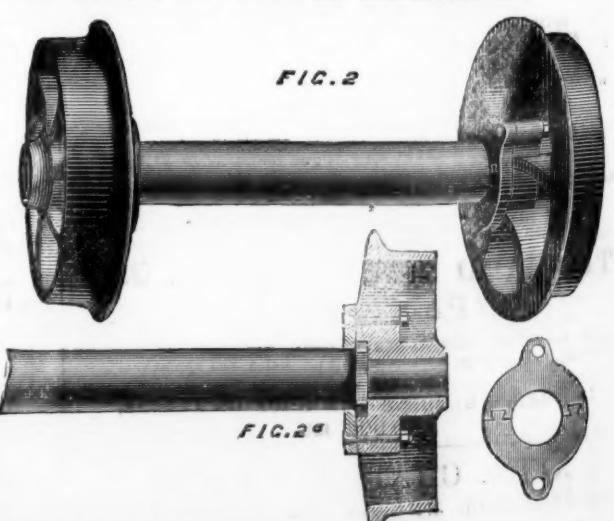


Figs. 1 and 1a show a longitudinal view and plan of a pair of cast wheels and axles fitted up for outside bearings, and Figs. 2 and 2a for inside bearings. A A. are the wheels; B. is the axle; C C. the washers; D D. the bolts; E, the collar on axle B; and F, the recessed boss in the wheel.

The wheel is cast with a recessed boss in the inside, made to any shape, corresponding in shape and depth with a collar formed on the axle, which is forged of solid steel; the axle is secured into the recess partly by being sufficiently tightly fitted to require driving home with a hammer, and partly by the washer. Around the axle adjoining the boss is fixed the washer, made in two parts and dovetailed, so as to allow of being fixed after the collar has been forged on the axle. The washer is secured to the boss by bolts and nuts, both in outside and inside bearings; in the case of inside, by means of lugs cast on the boss, and the washer made of corresponding shape; the washer is made of crucible cast steel. The only tool required for fitting is an ordinary spanner for outside bearings, and a box spanner for inside bearings.

Now what are the advantages of this method? You secure a simple way of fitting—it can be done by anyone who has seen it—the only tool required being a spanner; the wheels can be detached from or secured to the axle in a few minutes. The next

advantage is the perfect solidity attained, the wheel and axle practically becoming as one piece. The durability results from the toughness of the material, and the solidity secured in the fitting. Another thing is the wheels do not need to be put in the fire to detach them, as is the case in ordinary wheels. (N.B.—Our wheels cannot be injured by being heated and plunged into cold water, which would render other steel wheels perfectly brittle as glass.) Saving in fuel and wages is evident—no skilled labour being required to refit wheels in case of a strained axle. By adopting this system colliery owners may save hundreds of pounds sterling yearly.



Original Correspondence.

OUR EUREKA, NEVADA, CORRESPONDENCE.

YIELD OF THE EUREKA DISTRICT FOR THE SIX MONTHS ENDING JULY 1—CAUSE OF ENGLISH MINING FAILURES

ON THE PACIFIC COAST.

SIR.—Even though it is neither desirable nor creditable to commence a letter with the weather for a topic, what else can one do with the mercury at 110° and 115° in the sun, and iced drinks at a premium, than to give expression to the thoughts which float nearest the surface. The weather at present is immoderately warm, and has been so, too, with short intervals, ever since the dawn of the national holiday which, as of old, was celebrated with great *eclat* by the people of Eureka. The day was ushered in at the Richmond with a national salute, fired just as old Sol's morning rays began to bathe the eastern slopes of the western hills in a flood of light. Our cannon, owing to the scarcity of the death-dealing article in the region were, as is usual, improvised for the august occasion out of a couple of the smiths' anvils, which, with a plentiful supply of powder and a "drop of the craythor" to impart the necessary stimulus and inspiration to the brawny furnacemen who acted as gunners—all, even without the aid of the "wee drap," brimming over with Fourth of July patriotism—produced by the answering reverberations from the hills and crags around as grand and as startling an effect as one can well imagine. Had we lived in the neighbourhood of the Balkans, and heard so lively and resonant a morning's fusilade, it is certain we should be found making rather hasty toilets preparatory to defending the fort against the assaults of the followers of either Czar or Prophet. But, happily, our lines were cast in pleasant places, consequently our toilets were made in that easy leisurely way which become men who were to participate in celebrating the 102nd anniversary of their independence, and who had to listen to the usual "Spread Eagle" style of oratory on each recurrent Fourth, which so unmercifully berates that metaphorically garbed old gent—poor, amiable, Mr. Bull.

If I except the receipt of the long-promised Richmond report, with its kite-like continuation of recommendation, I am not aware of anything local having occurred to disturb our mental equipoise or break our monotonous surroundings that would either enlighten or interest your reader. Present life on the Base Range is of that flat, stale, and unprofitable sort which produced very little beyond a wish that one could exercise the functions of the quarry of the air, and, *Dædalus*-like, venture upon a flight to some far off Utopian isle, where one's chronic necessities would not be forever troubling him, and where he would not have to submit to perpetual drudgery in order to make a passingly presentable appearance among those whose couch may be not a whit more luxurious than his own.

But since Mistress Fortunio could not afford to place a silver spoon in the mouths of all of us at the hour of nativity we must, perchance, content ourselves with the lot she has imposed upon each of us, and continue to hope for better things. Midas is fabled to have turned all he touched into gold. Would that old Father Bacchus were equally generous to all of those who occasionally pledge him in the red and ruby product of that which he himself first planted at Naxia. But why forever long after the impossible? Because we cannot help doing so, as it is a condition of our nature to be forever wishing for the unattainable. Better to invoke the aid of some friendly genii, such as attends fortunate prospectors, to assist us in discovering a bonanza of equal dimensions with that underlying Ruby Hill. But though bonanzas are plentiful enough in many of the mining sections of Nevada, it is not always that a poor devil is so fortunate as to drop upon one such as the above. But great though that has been and is still reputed to be, the chances are largely in favour of their being bye-and-by, when deeper developments will have been accomplished on both Ruby Hill and along the slope of Prospect Mountain, discovered bonanzas of much vaster proportions than any that have been, thus far, uncovered in the wilds of Siguland. Reports of such discoveries reach us every day from distant localities. The latest is that from a place called Downeyville, a recently organised district in the adjoining county of Nye, in which is the Tybo Consolidated property. Should the Downey Brothers' bonanza continue to expand in like ratio to what it has done since struck, they bid fair to become as wealthy as the quadrilateral firm owning the Comstock bonanza. The ore is reported of the argentiferous quality that is easily smelted, and varying in value from \$200 to \$200 per ton, with 2000 tons of such ore on the dumps awaiting the slow action of one small water-jacket furnace. The dolt, why commence operations with a reduction apparatus all but obsolete among practical metallurgists? But they are only following in the path trod by many before them. Experience, like wit, is perhaps better bought than thought, since it is likely to be longer remembered, and consequently of greater value on that account in after life. The oblong stone furnace is now almost universally used in the silver-lead districts of the Coast, because they are found to be less expensive, more durable, and give far more satisfactory results than any other furnace now in use. But while I say this, I must also in justice to other reduction agents state that a style of water jacket now in use at the Richmond has, from actual working test, shown that while the work done is just as good as that performed by other of the stone furnaces, its consumption of fuel is more than 30 per cent. less than is consumed by its stone neighbours. This is an interesting showing, and at this juncture an important one too, since it demonstrates the superiority of Mr. Probert's "hobby furnace," as sarcastically named by the commissioners, over the stone cupolas, in the matter of lessened consumption of charcoal. But, as I said above, the stone reducers are by long odds the most desirable. The ones now in operation at the Richmond have been in constant use since last September, and they are at this writing capable of being run until the 1st of next September too, a period which would make exactly twelve calendar months. This is a surprisingly long run, with but occasional temporary stoppages to bar out, or make repairs around the side tuyeres, where the heat is greatest. It is due to Mr. Probert to state that to his genius for experimentalising as to how best to increase capacity, power, &c., without incurring a corresponding increase in current expenses is attributable. Much, if not all, of the saving that has been accomplished in the matter of frequent relining and consequent stoppage of furnaces, and at times, too, when it is most desirable that they should be running.

I make this statement from an actual knowledge of the facts upon which it is based, and not from any desire to make a favourable showing for Mr. Probert, or disprove the ungenerous indictments of the late commission. Whatever the differences existing between the former and the latter it is no concern of mine, nor, indeed, of anybody else outside of those most directly interested, and I refer to them here only for the purpose of recording such facts as have come under my own immediate observation, and which to my notions differ somewhat from the statements of the report which substantially attributes the durability of the furnaces to the presence of the increased quantity of silver fed them in the purchased ores; whereas the increased resistance of the rock to heat is, it is affirmed on all sides, largely due to their enlargement and to the continued bushing of the tuyeres, so as to reduce their blast space toward the point which enters the furnaces. This diminution of course necessitates a corresponding diminution in the amount of blast furnished before these experiments took place. I give the facts, let your readers draw their own deductions from them. Let justice be done, though the heavens fall.

Ruby Hill still continues to yield up its gnome guarded treasures as abundantly as ever, and the prospects are as encouraging as at any previous period since first opened. It is a wonderful hill, and without indications prove false it bids fair to eclipse any exhibit of wealth which it has yet made. The approximated yield of the mines and furnaces of the district for the month of June, and for the present year, is as follows:—There was shipped from the Eureka district for June account crude bullion valued at \$731,000, in addition to \$226,632 sent forward by the Richmond Company. The value of the lead freighted during the same period was estimated at \$175,000, and the ore and flue dust shipments it is calculated

added \$70,000, making in all a grand total for June of \$1,202,123.62. This exhibits a decline of about \$40,000 from the May product, a fact accounted for by June being a short month. From January 1 to about July 1, a period of six months, the total yield of the district will aggregate \$7,000,000 (1,400,000.). This amount, though enormous enough, is largely in excess of last year's entire yield. What think your Transatlantic sceptics and grumbler of this almost unexampled output of treasure, and that in the short space of six months too? What proportion of this vast yield was produced by the Richmond I am, of course, unable to say, but that it was no inconsiderable sum may be inferred from both the quantity of lead and doré bars shipped during June, as shown above. Still the Richmond shareholders appear to be dissatisfied. What would they have? Are they not satisfied with having received 78 per cent. of what has been realised during the last six months? Well, I think they ought, and they ought also to cease drawing in dolorous strains continued attention to their losses in connection with the Richmond, for it has been to many of them a veritable blessing.

If English speculators have lost by the mines of this country they must attribute such losses to their own folly, as I have heretofore shown, more than to the unworthy character of our mines. If men will persist in entrusting the care and management of their properties to agents and self-styled professors whose knowledge of either mineralogical or metallurgical operations is limited to what is gleaned from books, reports, &c., and who know just as little of the details of mining generally as they do about the Chaldaic language, they must expect to reap just as they sow, for if they plant the wind they certainly will reap the whirlwind. Mining, like every other branch of industry, must be understood so as to be made successful. The majority of the failures resulting to English mineowners in this country have arisen from bad management, and the unbusiness-like system of favouritism pursued by London mining boards with regard to selecting managers and other high salaried officials, who ought to be selected because of previous experience, rather than for their social position and connections. This in a great measure is the rock upon which they have founded; the maelstrom which has swallowed up all their loose coin, and caused them to seek the aid of the winding-up courts to free them from their burdens.

But since I have pursued this topic far enough for the present, I will just add by way of winding up this already over-lengthy letter, that the Richmond gentlemen have had given them very little cause to condemn the management of their property. Had all the American properties started in London but been as carefully and as well managed, the English people would have less cause for complaint against Nevadan enterprises.

J. D. POWER.

Eureka, Nevada, July 15.

THE EMMA MINE—THE COMSTOCK BONANZAS—ONE OF THE BONANZA KINGS—LEGITIMATE MINING, &c.

SIR.—The principal brokers and mining men of position congregate every evening at the Palace Hotel, San Francisco, and most of the current mining topics are discussed. I met there Mr. James G. Fair, who is and has been the pioneer and successful superintendent of the two richest mines in the world; in fact, he made the fabulous fortune for Flood and O'Brien, and is also partner of Mr. McKay, another millionaire, whose wealth has been written about in most papers of Europe and America. Among other matters discussed by me with Mr. Fair, I propounded the following questions to him:— "I believe, Mr. Fair, your name and mine appeared some three years back in a pamphlet published by Baron Albert Grant, in a defence he made of the sale of the mine? Your name was signed under a report, or opinion, as to the Emma Mine, and you spoke of the great future of that mine, provided it was properly prospected." His answer was—"I did give my opinion over my signature, and I remember seeing it afterwards in print. I fully authorised Baron Grant to make use of my views." I then said—"I have never met or spoken to Baron Grant; he used my name without my authority. I was absent in Peru at the time. He not only published my views on the Emma Mine in his pamphlet, but likewise had 5000 copies of my Emma pamphlet republished and circulated. I alluded in the pamphlet to the great riches which would be produced by the bonanza mines. On page 7 you will find what I stated was being done by Americans on their mines on the Comstock—especially the Consolidated Virginia Mine. My prediction four years back, as found in that pamphlet, of the dividends from Consolidated Virginia have since been verified and astonished all the world, for they have turned out beyond everybody's expectation."

Mr. Fair continued, "It is a sad thing to see how fearfully mismanaged most English mining companies have been in the United States. When they do get a good mine they squabble over it like Kilkenny cats, and the profits go in lawsuits. For example, the Emma, Flagstaff of Utah and the Richmond, in Nevada." "Mr. Fair," I said, "in England the public have the idea that only bad properties have been offered to them by Americans, and they consider this to be the reason why nearly all their mining ventures in the United States have had a disastrous result. I myself offered them several properties in 1871 at bed-rock prices. First, the very mine you name, the Flagstaff, which I offered to them for 12,000 ℓ , sold six months afterwards for 300,000 ℓ . The Ontario also for 8000 ℓ , which has produced more than 200,000 ℓ in dividends up to date, is likely to continue paying its monthly dividends from \$50,000 to \$100,000 some time to come. I offered the No You Don't, alias Telegraph, Mine in Utah for 4000 ℓ . It has produced 160,000 ℓ . in dividends, and is still very rich. Also the Yosemite Mine, in that territory, for 12,000 ℓ , which has also produced over 60,000 ℓ . to its owner, the deceased Colonel W. Johns.

"I was lately sent out to report on two broken down English companies in Alpine County. I advised them to move one of their mills to Columbia district, or Bodie, where I could have got them a mine with 4000 tons of ore in sight, and could have made a great success for them. But John Bull is very obstinate, and will not follow the advice of experienced men. All he does is to grumble at his bad luck, crying over spilt milk, instead of making a good bargain so as to get out of his troubles."

Mr. Fair then added: "I imagine that English people are under the erroneous idea that we make our mines pay because they were originally rich from surface downward, and that all we have to do is to blast out the rock and mill it. Why, you may not be aware of the perseverance I have had to show before producing the millions upon millions of dollars out of our now two celebrated mines. I had to sink a shaft 1200 ft. without a trace of ore in sight anywhere, and then I had to follow a small cleavage half an inch thick for 420 ft. before I ever got a trace of silver."

I said, "Mr. Fair, I allude to this fact on page eight of the Emma pamphlet, especially about the mine under your management, and the enormous sum laid out, and the amount of work done without a trace of ore, and that you were nearly two years before getting any ore. My British countrymen would like to have the \$200,000,000 you have taken out of the earth, but they only believe in the old Cornish saying that 'miners cannot see beyond the end of their pick.' Of course I know this to be a fallacy. In my long experience of mining all over the world I have seen mining men like yourself who have the initiative idea which long experience teaches them to state pretty clearly where a body of ore is to be found. It is true many fail, not from want of an intimate knowledge of their business, but we find very few plucky people like the Comstockers and Californians who will back an experienced miner with the necessary means to prove himself right. Your people backed you with enormous sums of money, and you also had their sympathy, consequently you had success."

MIRACLES EXPECTED OF MINING MEN.—The misfortune of mining men is that they are expected to work miracles, and in most cases without the means allowed to civil engineers and other professions, who fail often with means, whereas the miner has often to make a success with paltry means and under great difficulty which few outsiders can comprehend. A civil engineer may make mistakes; over estimate his outlay and returns. He may plan a railway and report the construction to cost \$5,000,000, and nothing is thrown in his face if it costs \$10,000,000. And if it does not pay it may do so some day—every allowance is made for him. No railroad paid dividends for the first ten years in England.

Everybody was ruined by them, and yet civil engineers were not abused. The Great Eastern steamship was a failure, and many other such enterprises. But woe betide the mining man who makes a mistake as to a mine. No allowance is made for him. He has to make his calculations often without even being able to reach or get at positive facts, and difficulties meet him at every point and turn. He has to grapple with the dark mysteries of creation, and often is forced to guess against them. With him it is groping in the dark, and yet if he makes a mistake he is branded as an impostor, cheat, &c. Ours is a hard life, and only among ourselves do we comprehend the iron will and perseverance required to keep even one's head above water at times.

THE INFLUENCE OF THE STOCK EXCHANGES ON MINING—LEGITIMATE MINING.—Mining certainly for some time past has been greatly benefited by these institutions, but in the long run they have injured the legitimate interests of mining. They have tended to exaggerate the prices of mines in such a manner that inflations followed by reactions are the order of the day, thus causing a distrust of mines and mining men, and, in fact, killing the mammoth goose which has always laid the golden eggs for them. When mining was carried on by the old Spaniards in Mexico, and other South American countries, it was done for a legitimate purpose, that of making the mines produce, and they did produce untold riches. Great works were carried out in the Andes, in Peru, Mexico, and Bolivia, against immense difficulties without roads or steam power—all this was carried out by the mining man, and with a production of over \$4,000,000,000. The miner, although often abused, has been the civilizer of the world, for without the precious metals we would be no better than savages at present. In those times the mining man stood well, was respected everywhere, and honoured by kings with titles of nobility. He had the sympathies of everybody, allowances were made for any mistakes, and his actions not prejudged. The difficulties he had to contend with were thoroughly understood. However, I believe the time of the inflation of mining stocks is pretty well played out all over the world. It is not easy to float a mine anywhere at present, unless it is sound. This circumstance will bring on a reaction in favour of legitimate mining. Then the true miner will be appreciated, his experience valued, his reports believed in, and he will be looked upon as a respectable member of society. Numbers of American prospectors arrive in San Francisco, many with good mines, as no wild cat will go down with anybody. But the want of completion of English purchases has been the cause of the lowered price of mines. Even in Arizona, where the mines are immensely rich, Americans are now beginning to see the folly of many of their smart and astute countrymen in driving English capital out of the United States by continual lawsuits, &c. It is too late though at present the harm is done. It is no use locking the stable after the horse has left. These men have often asked me, "Why cannot we sell our good mines, Mr. Sewell?" My answer has been, "San Francisco is only a one horse town with about a dozen dealers in mines to about 5000 that are offered for sale, and no English purchasers."

I hope Mr. Editor you will get the pamphlet which was published by Baron Grant, and quote from it what the present Bonanza King still adheres to about the Emma Mine. At that time he was simply Jim Fair—now he is known in Europe as one of the Bonanza Kings.

HENRY SEWELL, M.E., F.R.G.S.

Salt Lake City, July 20.

THE HYDRAULIC MINES OF CALIFORNIA AND CHILE—THE EMMA MINE.

SIR.—I have left San Francisco, and may have to remain here, as the centre of operations for Nevada. I was again, after an absence of five years, amongst the gold quartz mines of Nevada City and Grass Valley, also inspected again several of the hydraulic gold mining companies of Dutch Flat and Gold Run, and for certain reasons paid particular attention to the property of the Cedar Creek Hydraulic Mining Company (Limited). I was induced to make these inspections, as I hope some day to return to Chile, where there appears to be a sound and healthy excitement in hydraulic mining, as you will see by the following, from the Mining Record of N.W. York, which please publish with this letter. I also enclose for publication a letter from the Salt Lake Herald on the Sulphur Mining Industries of Nevada and California.

I have good deal to communicate to you with reference to the Emma and Flagstaff Mines. In the former Superintendent Collins appears to have cut a vein about 3 in. wide under the old works of the Emma Mine, at or about the level of the Bay City Tunnel. As I intend to inspect the Emma Mine, having a standing order from the New York Emma Mining Company, I shall soon be able to give you details from personal observation.

HENRY SEWELL, M.E.

GOLD MINING IN CHILE.

In the summer of 1876 there appeared in several of the San Francisco papers extended articles relating to the gold mines of Chile, South America, but more particularly of a locality termed Catapilio. By the last steamer from Aspinwall we have Chile papers of dates as late as April 23, in one of which is a long letter from the facile pen of Señor B. Vicuna MacKenna, Chile's historian, and one of her most honoured sons:

Catapilio, April 20.—I came here to fulfil the promise I made you, and send you my impressions in relation to this property. My travelling companions are Mr. John Ashley Walker, Mr. Antonio Subercaseaux, Mr. Oswald Rodriguez (secretary to the Mayor of Santiago), Capt. Borgono, the Rev. Curate of Vina del Mar, and my cousin, Januario Ovalle. We arrived in the early morning at the Laguna of Catapilio, where the habitations of the native gold miners are, and also the temporary residence of Dr. A. P. Barnes, the superintendent of the New York Company, that is prosecuting a work of great magnitude in the immediate vicinity.

Mr. Barnes is a graduate of the University of Baltimore. He is a skilful surgeon and physician, full of energy and enterprise, with his whole soul in the work he is trying to accomplish. The population of Laguna was formerly about 500 souls, but since the great works were begun double that number have found a home in this village by the sea.

In company with the doctor, who acted as guide for our little party, we passed over a new and finely constructed road, and were soon upon the Quemado Hill, from which for centuries the native miners have extracted millions of dollars. But the crow-bar, pan, and leather bag of the Chile miner is hereafter to be numbered among the things that were, and a grand comprehensive system of hydraulic mining take their place. A single little giant nozzle doing more work than a thousand Indian miners stimulated by the lash. The borders of this hill are full of old shafts and holes, some of them 150 ft. deep. In one of these shafts, named La Mina del Caballo, on the side of the hill a miner named Ramon extracted over \$150,000 during a period of 14 years. He squandered his earnings in riotous living along the coast, but died at last in the public hospital at Santiago. His name, however, is still mentioned among the noted miners of Chile. The ground belonging to this new company has been thoroughly tested, and is found to pay an average \$1.25 per cubic yard from the surface to the bedrock. When we consider that they are working ground by the hydraulic process in California which pays less than 10c. per cubic yard, and are realising thousands of dollars as profits from such work, one would hardly dare believe the figures that result from calculations based on ground known to be as rich as the Quemado Hill, for it is a fact that a single cubic metre of Catapilio earth has yielded over \$1000. Nuggets are often found weighing 1 lb., and in washing the old abandoned dump of the miner Ramon, mentioned above, over \$3000 was secured by a few miners last winter during the rainy season. There was a time, in 1863, during which the four principal gold brokers of Laguna—Martin Montenegro, Francisco Benavides, and the Gomez Brothers—collected for a few weeks the amount of 45 lbs. of gold weekly, which they sold to the Valparaiso goldsmith, Moyon, and at the mint in Santiago. Catapilio gold is said to be the finest in the world, and sales have been made at the United States mints at \$20 to the ounce.

Dr. Barnes explains the richness of the Quemado Hill upon the theory that an ancient river channel runs through it, and when in a playful mood we bantered him upon its possible value, he was equal to the emergency of the occasion, and although his dark eye twinkled with merriment not a muscle relaxed as he informed us in a confidential whisper that he believed there was as much gold in Quemado as in the Bank of England.

But here let me say that all I have written or may hereafter write in regard to this property or any other in Chile is and will be in the spirit of a correspondent, and I hope that my frank words will not furnish any grounds upon which to build a wild and foolish speculation, nor cause even the natural excitement which the human mind experiences while contemplating the discovery of the precious metals.

Those who are familiar with my historical writings for the past 20 years know how old and positive my convictions are in regard to the hidden golden treasures of my country, and to-day I am more firm in my convictions than ever. To convert this hidden wealth into coin we do not require adventurers, speculators, or manipulators of anonymous societies, but honest, prudent, scientific, quiet, systematic men, who will carefully investigate and execute, as this New York Company have done. Again let me caution my countrymen not to be led into wild speculations by adventurers who will point to the success of the North Americans at Catapilio, and attempt enterprises which, proving inglorious failures, may involve hundreds in their ruin, and if I thought for a moment that these lines would cause any unhealthy excitement my pen would stop right here, and these written words should turn to ashes.

The doctor informs me, that the company he represents have secured 106 claims,

of 10,000 square metres each, and have secured all the water rights in the district; thus giving his company a monopoly of all the gold bearing ground at Catapico.

To Olegario Ovalle, one of the owners of the estate, upon which the mines are located, the New York Company is greatly indebted, for he too has imbued the spirit that actuates the doctor, and by his royal hospitality and means to accomplish ends has done much toward forcing the works forward.

Ground was broken by this company last November, since which time some 17 miles of canal have been finished; this canal is 8 ft. on top, 5 on bottom, and 3 ft. deep; cut on the side of the hills mostly through a rocky formation. There are tunnels on the line of the canal that have been cut through the granite hills by the use of dynamite; their lengths are 130, 121, and 90 metres each. The canal has some deviations with the object of collecting the waters from the mountain streams, and also to give elevation at or near to where the water is to be distributed to the Little Giants at the mines. Flood gates and receiving gates are scattered all along the line, and the excavated ground has been so deposited that a good road for horsemen runs the entire length, over which watchmen will ride night and day guarding the property. The canal crosses 13 ravines, more or less wide and deep, the waters passing through flumes supported by trestle work made of the best Oregon pine. One of these flumes or aqueducts is as imposing a structure as the viaduct of Los Maquis; it is 320 ft. long, 82 ft. high, and is supported by 13 columns as broad and strong as those supporting the secondary canals of Maipo. After a four hours ride we came in sight of the beautiful central houses of Catapico, the summer home of Olegario Ovalle, and at 3 P.M. we reached the most interesting point on the line—flume No. 13, situated in the ravine called Maitenes. Although it was Good Friday, there was an army of carpenters at work under the direction of the superintendent of construction, Capt. John Simpson, of California, an experienced hydraulic mining engineer. The captain is 45 years of age, and has the appearance of a true Hercules. Seated on a rock near by watching her husband at his toll sat Mrs. Simpson, veiled and gloved; as we entered the ravine we gave three cheers for the work, which came back to us in echoes from the mountains, and before we left we gave three more for Mrs. Simpson. The captain painted his house white, and calls it the "White House," in memory of one at his former home in the North.

On our return to the central houses of the estate by a different route we passed many old workings, proving that all the hills of Catapico carry the precious metal. The name Catapico has a native significance highly interesting and strange—*Cata* means in the Indian language hole or shaft, and *pico* a narrow channel through which gold is washed. For over a century Catapico has been the property of our family, and my earliest recollections are connected with it. During my childhood I have listened with delight to the fabulous stories told by the fire-side of the wild Indian miners. One I remember well. It was at the end of the last century an Indian miner was dying in the hospital at Santiago, and being grateful for the care given him told his attendant of a rich deposit of gold at Catapico. A fabulous amount was afterwards taken from the spot described by the dying Indian. Are the dreams of my childhood to be at last realised. While I am writing here the native miners have brought and sold me their gold, but when these hills are melted away by the water of the hydraulic nozzle who can tell the sum that will be required to purchase the product?

We had the pleasure last year of seeing and conversing with the president of the New York Company, John H. Flagler, who came here to investigate for himself the value of this property. He was fully satisfied, and at once gave wings to the works, and I am invited by the superintendent to visit him again in June, when if rains a clean-up will be made, and I shall again report to you my observations and conclusions.

—*Mining Record*, New York.

A NEW PATENT FOR MANUFACTURING BRIMSTONE.

Since we announced the granting of a United States patent to Mr. HENRY SEWELL, M.E., for furnaces to work native sulphur ores without fuel, water, or iron retorts—these furnaces are made of common stone and mortar, costing each \$200, and with a capacity of 200 tons; two men can attend to five of these furnaces—we have procured some particulars from him as to the business in the adjoining States. There are three incorporated sulphur mining companies at the Rabbit Hole district, which is some 25 miles from the beautiful station of Humboldt, on the C.P.R.R.; two of these are forwarding large quantities of sulphur to San Francisco. At first they used the old and costly process of iron retorts and fuel, but had to give it up as too expensive, and the plant equally so. They have now put up the so-called steam process, which also requires fuel and water, having also, as in the former, the great disadvantage of freighting their ores four miles to water, at an expense of \$32,000 a year in this item alone. With Mr. Sewell's process (which he informs us he worked in Spain successfully six years, making \$30,000) the ores can be dumped into the furnaces at the mines themselves without the use of fuel, water, or iron retorts. Two of the Humboldt companies made splendid overtures to Mr. Sewell some four months since for the erection of his furnaces, but he declined them, as his patent had not been granted. There is another company working in Lake County, California, also one near Los Angeles. The most important, however, is in Lower California, and three miles from the Colorado river, having water freight to any part of the world. This mine is owned by Gen. Houghton, of the Home Mutual Insurance Company, of 406, California-street, San Francisco. This gentleman also made offers to Mr. Sewell for his furnace. When he left San Francisco four weeks since the patent had not been granted, and it is only within the last six days that Mr. Sewell was advised from San Francisco that his patent had been granted; this will change his programme, which was to continue his journey on to London on other business matters.

The consumption of sulphur is increasing very greatly in California, and a new factory has been established in San Francisco recently for the manufacture of sulphuric acid for producing artificial manures; 10 tons a day are now manufactured, and more factories of this class are announced, there being a demand for the article, as farmers find their wheat crops produce less and less every year for the want of fertilisers. England consumes 1,000,000 tons of sulphur for fertilising. The orange groves of Los Angeles and vineyards in different parts of California, as well as other fruit trees, have suffered considerably from different fungi, and large quantities of sulphur in powders and flowers will in future be employed, following the example of Europeans in this particular. We wish Mr. Sewell every success in his new enterprise; he is an energetic man, as his history has already proven.

—*Salt Lake Herald*, July 11.

BONA FIDE GOLD MINING.

SIR.—As gold mining appears to be attracting considerable attention just now, it may not be amiss to caution intending investors against entering into speculations that are not *bona fide*. I remember about ten years ago, when there was almost a mania for mining, as much as 80,000*l.* was paid for one property, the name of which was not even known to the subscribers until after the money had been paid, and 60,000*l.* put safely into the pockets of the promoters. This mine proved a failure, and many good mines suffered in consequence. I firmly believe there is nothing that pays so well as mining. At the same time speculators cannot exercise too much caution in the selection of their mines, and I would advise them to have nothing to do with any mining property unless the vendor is prepared to offer a reasonable trial of the mines previous to concluding the purchase. I do not hesitate to say that persons who believe in the legitimacy of their own schemes will be prepared to offer any gentleman, firm, or company, a fair and reasonable trial of their mines previous to negotiating the sale of them. If this mode be universally adopted there need be no fear of the ultimate results, and mining will again assume that position amongst the commercial enterprises of this country which its importance warrants.—*Aug. 5.*

GOLD MINING.

SIR.—It is gratifying to read your most valuable Journal, and to find the celebrated gold mine St. John del Rey making a profit of £300*l.* for June, and the Don Pedro North del Rey gradually improving. It appears the superintendent of the latter mine has invented new appliances for bringing the metal to surface, and also for the retreatment of the refuse ores, all of which have answered remarkably well, and they are also taking wood from the company's own plantation instead of purchasing. These important items greatly add to the progressive value of the company.—*TOURIST.*

DON PEDRO NORTH DEL REY MINING COMPANY.

SIR.—I have read with interest in the Journal the letters of "Mentor" and Mr. Houston. Shareholders may be glad to learn from an eyewitness that the permanent pumping machinery is actually at work, thanks entirely to Capt. Vivian having commenced the necessary works without waiting for the sanction of the board, or it might now be lying the same useless mass of material as it has done for so many years. It would be curious to enquire into what this so-called board does. But seeing they draw 600*l.* per annum, and one a general and the other a colonel, who, of course, should have a vast knowledge of mining, we must hope that the report for 1877-8 will give us some idea of what they really do. However, Capt. Vivian in spite of some of the parts of the machinery never having arrived at the mines—want of wood and many other serious obstacles—has succeeded in erecting it and putting it in going order, and a faint idea may be formed of the grandeur of the work that the flat rods connecting the wheel with the pump extends very nearly half-a-mile, the balance bob, triangle bob, &c., working smoothly and noiselessly, showing no friction, the only sound heard being the falling water from the buckets of the wheel, which is yet uncased. The only doubt about the machinery is the wheel itself, the axle of which having been made round instead of square, and in three pieces instead of solid, the immense leverage of the wheel (60 ft. diameter 3 ft. 4 in. broad) makes a strain upon the bolts fixing the wheel to the axle that they are unable to bear without drawing. Capt. Vivian has not been able yet to overcome this defect, which is a constant cause of anxiety and trouble, and

may result in having to take down the wheel, in which case it would be better to abandon it, and make a wooden wheel of (say) 40 feet diameter and 7 to 10 ft. broad, placing it near the Praia, some 63 ft. below the present wheel pit. The rego that serves the flour and sawing mill could then be turned over the wooden wheel, and all difficulty would cease. It seems a pity to abandon a wheel that has cost so many thousand pounds, but it is better than fiddling with the axle till a breakdown takes place, and the mine fills with water. The present wheel may enable Capt. Vivian to proceed with the cross cut to prove if jacutinga formations give in depth, a theory consistently deprecated by all Brazilian miners, and therefore very interesting. Nothing, however, can be more annoying to a practical man like Capt. Vivian than the observations of Mr. Gordon, who was at the meeting the other day; an experienced practical man does not care to have his work criticised by an incompetent person. * * * * * CHARLES WILLIAMS.

Serra de Cocreas, June 28.

RICHMOND MINING COMPANY.

SIR.—Mr. Elliott concludes his letter in last week's Journal with the following words—"Every defender of the past management of the Richmond must certainly be henceforth struck dumb with astonishment;" and for his own reputation it is unfortunate that he was not thus afflicted, instead of appearing again in your columns as garrulous and loquacious as ever, and, I may add, as puerile, for I fail to see what "the Song of Miriam," or "Saul," or "David" have to do with Richmond business. If these references to Scripture history are intended to show shareholders that he is more conversant with ancient and biblical lore than he is with modern mining and smelting business, I willingly concede the point in his favour, and am prepared to admit that it would appear he has thus far benefited by intercourse with his reverend colleague.

My letter of July 24 cannot be answered by quotations from Scripture, and if Mr. Elliott has not evaded he has at least overlooked the points of interest to shareholders. I will, therefore, repeat them:—

1.—Did the "first" directors of the Richmond Company give 200,000*l.* for a property that was sold a few weeks before for little more than one-fourth of that amount?

2.—If they did not, who is responsible for that arrangement?

3.—Why did Mr. Elliott voluntarily place himself in what he calls the "cruel position of having to handle the property without a shilling of working capital," and to act as a "first" director?

4.—Why did he, as chairman of the company, permit the Eureka Company, "without an atom of justification," to work night and day for a period of nine months driving tunnel to get under our Pott's chamber and obtain the rich body of ore?

5.—Why was there such a lack of "judgment and enterprise" as to explorations in 1876 and 1877, that in April, 1877, there was not ore enough to keep one furnace going?

6.—Why, as chairman, did he allow himself to be overruled by his subordinates—the managers—to the detriment of the shareholders' interests?

7.—Why was it that Mr. Brereton's report in June, 1876, was not communicated to the shareholders?

8.—Why has Mr. Elliott rushed into print at this juncture? Does he wish to be re-elected as a director?

These are the few plain questions asked in my letter of July 24, of great interest to shareholders, and admitting, I should think, of equally plain answers; but Mr. Elliott appears to have overlooked them all, having possibly been "struck dumb with astonishment," as doubtless the shareholders will be if he will answer them explicitly. When he does this I will deal with his much less important rhodomontade as to smelting and mining, which he muddles up together, though they are totally distinct operations; and also deal with his "innocence" as to fluxes and fluxing ores.

In October, 1876, Mr. Probert said he had not "much faith" in his judgment, and I should think that opinion will be confirmed when he reads the letters Mr. Elliott has so injudiciously published.

Victoria-street, Westminster, Aug. 8. JOHN BAYLISS.

P.S.—I willingly continue my "illustrative lesson," and admit that although (judging by dividends actually paid) I would rather be a shareholder in the Eureka than the Richmond, I should infinitely prefer being a shareholder in the Comstock! and who would not? Possibly Mr. Elliott, giving us another instance of peculiar judgment, would prefer Richmond to either.

RICHMOND MINING COMPANY.

SIR.—I think the following facts should be placed before the shareholders of this company. I thought I knew nearly all that was worth knowing concerning the Richmond affairs and management *ab initio*, but I find myself mistaken. I am satisfied that the members of the late committee of investigation, with the exception of the Chairman, were equally ignorant of the facts I have now to disclose:—Shareholders will remember that there are two Richmond Mining Companies in existence, one known as the English company, the other as the American, or Richmond Mining Company of Nevada. This latter company was incorporated in the beginning of 1873, during the time that the first lawsuit between the Eureka Consolidated and the Richmond Consolidated was going on. Previous to the creation of this American company the Richmond property and affairs were managed by the London company through their manager and agent in Eureka. Upon the creation of that company all the property and management thereof were assigned to it, and the London board ceased to have any control of the management of affairs in Eureka. This state of things continued until Feb. 29, 1876, when the property was re-assigned to the London directors to enable them to execute a mortgage deed to secure the debenture-holders; this gave the London board again possession of the property and the control of the management at Eureka, which reverts to the shareholders, and the control thereof, to the American company, who are still in possession, and who control the management without the interference of the London directors.

Mr. Rickard was not appointed by the London board, but by the president of the American company, as will be seen further on. In order that shareholders may clearly understand the position of their affairs and property, I give the following extracts from the evidence given, under oath, by Messrs. Probert, Wren, and Corrigan in the beginning of February, 1877, when the first proceedings in the late lawsuit arose, and which was heard before Judge Cole at Eureka:—1. Evidence of the Rev. EDWARD PROBERT, managing director.—"I reside in Eureka; have resided here for the past three years and a half. A portion of the time I was looking after my own interests as a proprietor, and the balance of the time as trustee of the Richmond Mining Company of Nevada. The Richmond Consolidated Mining Company (Limited) is incorporated in England. I am a director of that company in England; as such director I have never transacted any business for it in Eureka. I never caused to be furnished vouchers of the expenditure of the workings at Eureka to the Richmond Consolidated Mining Company (Limited). I do not know that the money or the property of the Richmond Consolidated Mining Company (Limited) pays the expenses of the workings at Eureka. The Richmond Consolidated Mining Company (Limited) does not pay or defray the expenses incurred at the Eureka workings; these expenses are not deducted from the assets or property of the Richmond Consolidated Mining Company (Limited). I do not think that the Nevada corporation was created for the purpose of working the Richmond Mine for the English corporation. I do not allow that the English company own the property; it is assumed that the Nevada company work without the interference of the London company. I say that I do not know what property we have got here; the American company own all the property and work it. I pay particular attention to the property, works, and ground in Eureka as a subordinate; every act of mine must be submitted by me to the president. Some of the proceeds are divided with the English company."

2. Evidence of Mr. THOMAS WREN, President.—"I am attorney for the Richmond Mining Company of Nevada, and also president of that company since the resignation of Mr. Corrigan. The Nevada company was created for the purpose of procuring patents and holding the ground for the English company, and for the purpose of working the ground for the Nevada company. I do not know Mr. Rickard's position; he never did go into the possession under the letter of Mr. Corrigan, and also one to me requesting me to see that he was placed in his position. Every person connected with the mine is employed, paid, and is working for the Richmond Mining Company of Nevada; that company has located and applied for patents, and the English company exercise no control over the property; the property is vested in me under the bye-laws. Mr. Probert's advice is followed; I do not understand that he has any controlling authority; he is here representing the majority of the shareholders and his own business interests. The Nevada corporation was not created as an agent of the English company; it did convey the patents to the Tip-Top, Look-Out, and Richmond to the English company; if the other patents were obtained it would not be a breach of trust if they were not conveyed to the English company at their request."

3. Evidence of Mr. J. J. CORRIGAN, past-president.—"I know of the Richmond Consolidated Mining Company (Limited) and of the Richmond Mining Company of Nevada. I know the purpose for which the Richmond Mining Company of Nevada was incorporated. I was the first president after the corporation was created. Deeds were made to the new corporation from Clarence King, the agent of the English company. The Nevada Company was formed simply as agent of the English company, and to procure patents for them. You (Wren) told me that an alien could not hold mining property in Nevada. In order to get patents for our ground, and also for the better protection of the English company, it was necessary to form the Nevada company. You (Wren) told me it was necessary for the Nevada corporation to do the work; the work had been done up to that time (1873) by the Richmond Consolidated Mining Company (Limited). I was agent at that time, and held power of attorney from the Richmond Consolidated Mining Company (Limited). I always considered that the property belonged to the English company, and that it belongs to them yet. Mr. Rickard came over and took possession of the property for the English company" (this is contradicted by Mr. Wren). "The London board of directors directed me to appoint him superintendent of the Nevada company." My attention was called to this very startling evidence of Messrs. Probert and Wren in consequence of the following extraordinary statements which I recently saw in the Eureka Sentinel of June 27 last:—It is not so certain that the committee will succeed in disposing Mr. Probert from the management of the Richmond Company. As an officer of the Nevada corporation he enjoys legal advantages which, did he feel so disposed, might be used in a way to give the London directory a great deal of trouble. Of course we do not for a moment suppose that Mr. Probert would avail himself of unfair means to retain possession of the property, but we allude to possibilities, it being a settled fact that he is in a position, legally speaking, to seriously annoy the company in the event that he should feel himself unjustly driven to the wall. Presidents of American mines have given English companies a great deal of trouble, and also put them to great expense, and it is just possible that Mr. Probert, should he turn obstinate in consequence of proceedings taken against him, and trump up some claim against the company, they might find themselves in a dilemma."

This clearly shows that the directors having surrendered all the property and the control thereof to the Nevada Company the trustees of that company can act entirely independently of the London board if they see fit to do so. The board have thus really no power to force any of the recommendations contained in the committee's report on the management at Eureka, and it is, therefore, now no matter of surprise that Mr. Hopkins felt himself in an awkward dilemma about signing that report. I think it is a very great pity that he did not enlighten the other members of the committee on this most important matter. On looking through the past reports of the directors to the shareholders, and also through the proceedings of the various meetings of shareholders held since the creation of the Nevada Company, the following is all that I can find on the subject communicated to the shareholders. The first information of its existence appears to have been given in the report of the directors dated Nov. 10, 1873, and at the general meeting held on the 18th to receive this report, the chairman stated as follows:—"During the progress of the lawsuit, counsel for the better protection of the company's interests said it was imperatively necessary to incorporate the company in the United States of America, in conformity with the laws of the State of Nevada. This was accordingly done in the name of the Richmond Mining Company of Nevada. By the laws of the States no alien can hold a patent under the States. The counsel we had engaged, thought that to strengthen our position in this lawsuit it was imperatively necessary that we should be incorporated there. The facts of the case are these: In order to obtain the patent we had been under the necessity of asking a native of the States to hold the property in his name. Mr. King stood in that position. The property was assigned to him, and he again assigned it to the Richmond Incorporated Company, and we hold all the stock in it with the exception of five shares, which were necessary to qualify those who acted for us, and who were virtually our agents in the matter. We consulted our friend Mr. Vallance, who said we were quite safe in doing so."

This is all the information given to the shareholders that I have been able to come across. Shareholders were not told how many shares there were in the Nevada Company, copies of the bye-laws of that company were not furnished to the English shareholders, and the superior powers and rights of that company, as sworn to by Messrs. Probert and Wren in February, 1877, were never communicated.

There are 11,000 shares in the Nevada company. Four certificates for these were issued—one for 10,995 shares, to the directors of the English company as trustees for their shareholders, and three to the three trustees of the Nevada company. Mr. Probert holds one of these three certificates, as also a power of attorney from the directors of the English company for the 10,995 shares belonging to that company, and Mr. Wren and Mr. Thomas Price, the other two trustees, hold the remaining two certificates; so that practically the entire control at the present moment rests with the president and trustees of the Nevada company.

Mr. Corrigan resigned in February, 1876, in order that Mr. Wren, who was residing in Eureka, might be elected president, and thus expedite the transfer deed of the property to the English company, for the purpose of raising money by debentures; this deed was executed on Feb. 29, 1876. Shareholders were never informed of this transfer, nor of the subsequent re-transfer made in 1877 to the Nevada company. All that they were told was about the mortgage deed made of the property to Messrs. Elliott and Hopkins on behalf of the debenture holders, which the chairman referred to at the general meeting held on Aug. 23, 1877.

Shareholders can easily verify the accuracy of this information by referring to the Eureka Sentinel on file in the company's office, and to the various official documents and correspondence connected with these repeated transfers and assignments. The Eureka Sentinel of June 27 last must have been inspired with some object in making such startling statements, and if it be true that the English shareholders are not secure in the possession and control of their property the sooner they know this the better.

The English shareholders in the Nevada company can only interfere by calling a meeting of that company in Eureka, for which a month's notice must be given; at such meeting they have the power to elect new trustees, two of whom must be citizens, or who have declared their intention to become citizens, of the United States. The directors in London have also the power to cancel the power of attorney now held by Mr. Probert, but they have no power to remove him or Mr. Rickard, or any other of the employees of the Nevada company, or to appoint anyone with executive powers over the property and management in Eureka. On the other hand, the president, in concert with the other trustees, has the power to dismiss Mr. Rickard at a month's notice, and to appoint another superintendent for a term of years. The London board, therefore, at the

present time, occupy virtually no executive position in reference to the possession and management of the property in America, if Messrs. Probert and Wren's evidence is what it appears to be.

Aug. 8. R. W. BRERETON.

THE FLAGSTAFF MINING COMPANY.

SIR.—Professor Vincent has been here since June 15, and has taken great pains to extricate the Flagstaff property out of the meshes into which it has fallen through the intriguing of some of those who have made themselves wealthy out of it. A suit was filed against the Flagstaff Company the day before yesterday, praying the Court to be relieved from the obligations of the lease, but still giving the parties possession of the Flagstaff Mine until such time as they were paid what they say the company owes them, claiming that most of the ore extracted by them was not Flagstaff, but Virginia, ore.

Now, of all that has been played on that company the above crowns everything, and it will certainly be a disgrace for the Utah courts if they permit transactions of that kind. The Virginia is nothing but a bogus or, as called legally, a non-mineral bearing claim. The location of this claim is made on pure dolomite rock, without a trace of vein or mineral body of any kind within the boundary lines of the claim except the Flagstaff. Mr. Lockwood, one of the shining lights of our profession, tries to protect the parties by saying that at the Virginian dolomite several hundred feet thick was the vein, and this gentleman actually swore to that preposterous assertion in court. I leave it to all professional miners to decide the pros and cons of a vein of dolomite several hundred feet thick, with the atmosphere as hanging-wall, calcite as foot-wall, and about six parallel claims covering the thickness of one vein only, which surely beats the world-renowned Comstock. I was surely right when I warned the English shareholders through the *Mining Journal* two months ago against the parties to this suit. I again advise the English shareholders strongly to club together, pay off their real liabilities, compromise with their opponents, and get their property, which is able to pay 100,000*l.* in dividends per year. I trust the Flagstaff shareholders will for once see what is really to their benefit.

Before I close my letter I find it but right to give the shareholders a clear insight into its affairs. When Professor Vincent arrived here it was at the darkest time the Flagstaff ever had; what with the Davis suit decided, the Helen Tarbet judgment confirmed, and the new suit, the affairs of the mine in every way looked really gloomy. Had the president of the Flagstaff Company arrived sooner, or had he even arrived with funds, things would not have reached this extremity, but as the Court thought the company took no interest in their affairs here, they supposed the company had given up their mine, and so they gave judgment which I doubt they would have given otherwise. The Professor immediately after his arrival went to work with energy to undo as much as possible of the harm done. He appealed one part of the Davis suit, and will get a new hearing for the other part, and he appealed the Helen Tarbet suit before the Supreme Court of the United States.

I am informed from reliable sources that the Professor intends to leave for Washington in a few days, there to represent in person the interests of the company, and the only thing for the shareholders to do is to sustain their president with the necessary funds to enable him to get the mine back. Now, what I think I may be right in saying is that the company has now the right man in the right place to look after their interests practically.

W. BREDEMEYER.

Salt Lake City, July 19.

PEACE—WITH HONOUR.

SIR.—Now that it is to be hoped we are on the eve of emerging from "hard times," with a fair prospect of culling the first fruits of that era of prosperity and industrial activity which "peace with honour" initiates, it is purely a question whether money shall be advantageously applied and directed to sound and expansive investments at home, or, on the contrary, foster speculation in specious, yet spurious, schemes and undertakings in foreign lands. If the former are to engross the attention, and to absorb the "pent-up hoarded" accumulations of money arising from the chronic depression and distrust so unhappily prevailing throughout the past two or three years, happy and prosperous will it be for English labour, manufacture, and commerce.

The acquisition of Cyprus alone is of importance to the mining interests, as vast quantities of copper, silver, and lead are known to exist, and should public caprice take an outward bend it becomes those who in any way control investments to point out the advantages of this, Australia, New Zealand, the Cape, Canada, and other of our colonies, as preferable fields of industry and profitable use of capital to either America, Spain, Peru, Chili, Newfoundland, Mexico, or the Brazils. If we are to invest our money in foreign lands, employ their population, and spend the produce of their labour out of the Mother Country, why should not our cousins in Australia and in Canada have the benefit, rather than Spain, California, Nevada, Mexico, or Colorado?

Mining for a long time has been greatly depressed. Tin bears no comparison with former prices, or even the normal average of the decade 1864 to 1873 inclusive, yet we have to record Wheal Peever, South Condurrow, and Wheal Eliza as three striking exceptional successes, even with tin ore at 35*l.* per ton—a decline in value of 50*l.* to 55*l.* per ton since 1872. This is a lamentable fall for the county of Cornwall, still there is this happy reflection that Cornishmen discovered the tin in Australia, and that it is owing to the industry and sines of Englishmen that the ore has been brought to light in our colonies, while the trade, manufacture, and commerce of the Mother Country at home has been extended and augmented through the "cheapening" of the product. This is one of the results of free trade—importation with advantages to the consumer; and, fortunately, we are not indebted to foreign nations for the change.

Again, copper ore to the miner in Cornwall is worth only 11*l.* per unit, yet South Caradon, West Tregus, Mellanear, and even Glasgow Caradon yield dividends, and testify to the continued prosperity of those mines as brilliant prizes had the price of copper, owing to foreign competition, not fallen fully 50 per cent. in value.

Here, again, we are met by our colonies interfering with home-production; the Cape and Australia supplant the Cornishman, and the Queen's subjects at the Antipodes are advantaged, while manufacturers and consumers at home are likewise benefited. If capital can produce copper ores in Australia, at the Cape, and at Cyprus at 60*l.* a ton, why should we expend 70*l.* to 80*l.* a ton to raise the ore in the South-West Peninsula of England. Free trade is to buy in the cheapest and to sell in the dearest markets, and whenever mining for ore of copper in England ceases to pay we have most earnestly to hope that the fields of production will be transferred to our colonies. For next to the Mother Country the interests of Englishmen are centered in the success and prosperity of our dependencies abroad. Lead mining is chiefly directed to the Principality, and it is pleasing to record from time to time the discovery of rich mines. The latest are those of Pant-y-Mwyn and East Pant Du, while there are many others worthy of especial notice, and likely soon to command attention. As regards East Pant Du, Captain Roberts, a thoroughly practical and earnest working miner, discovered the ore, and rendered the works profitable at an expenditure of some 250*l.* to 350*l.* a month, and at present is returning some 40 tons of ore monthly with ten men, and a cost of only 15*l.* a month. The profits, now 2500*l.* to 3000*l.* a year, would easily be augmented to 5000*l.* or 6000*l.* as the reserves are large and augmenting, and admit of returns of 80 tons a month without entrenching unfairly on discoveries made and laid open.

Capt. Roberts appears to understand thoroughly the theory of flats traversing the millstone grit laying over the mountain limestone, and gave expression to many original and striking ideas as to the detection of deposits of lead ore in lodes under various circumstances and phenomena that highly interested me at my late visit to his compact, well laid out, and expansive East Pant-du Mine. His first principle of action is practical economy with efficiency of work. Reserves of ore in the mine are to him a source of ensured capital in case of need, and although a company has recently been registered in 20,000 shares of 2*l.* each, having 16,000*l.* working

capital, yet there is little cause to anticipate that it will be required. He has, however, secured the sinews of war (money) in case of need, and it would be good for mining in general if such prudent provisions were more frequently introduced in capitalising private paying properties before their introduction to public notice.

R. TREDINNICK,
Dealer in Stocks and Shares.
Exchange, 66, Coleman-street, London, Aug. 7.

THE ENGLISH LEAD TRADE.

SIR.—The highly remunerative character of the lead mines of Cardiganshire is, of course, in no small degree to be attributed to the magnitude and richness of the ore deposits, but in addition to such advantages they possess another, the importance of which in seasons of low values for ores is very great indeed, as it enables them to make profits when many undertakings not similarly circumstanced can only be worked at a loss. This opportunity for economical development is afforded by the abundance of water-power in and about the valleys of the Rivers Rheidol and Ystwith, and I think it may be fairly stated that all the principal mining enterprises of the district in a great measure owe their prosperity to the facilities for inexpensive working which can thus be obtained, although it is in no other case so well exemplified as in that of the Llŷn series. Situate for the greater part on hills abutting upon the Ystwith, the streams and water-courses of an extensive area commanding a high level have been utilised and stored in reservoirs which are chiefly of natural origin. The water thus at command is thence, by means of conduits or leats extending many miles, brought to the powerful machinery of the mines in succession, thus obviating the necessity for the expenditure of very large sums annually in steam-engines, fuel, and other attendant charges.

It would be a matter of some difficulty to estimate the extent of saving in mine cost thus effected, but as the sum represented has in the shape of dividends found its way into the pockets of the proprietors it need not, perhaps, be enquired closely into, at all events as to the balance-sheets of mines in which steam-power has to be relied upon will exhibit the enormous cost to which such undertakings are thus subject, and which in the instances now under consideration is wholly avoided. There are in addition to the mines already alluded to others which by their productiveness have contributed, and are still contributing, to the reputation for mineral wealth so generally accorded to Cardiganshire, of which much might be written, such for instance as the Grogwinion, a mine that has already proved to possess steady continuous supplies of lead ore in the levels laid open, from which no less than 1300 tons have been sold during the past 12 months, and from all that has been recorded is likely not only for many years to come to continue to send to market a similar quantity annually, but the recent work done in sinking and driving has disclosed yet greater capacity for even larger returns, the lodes having proved richer in the lowest workings than in the upper levels. This property is situated close to the Ystwith, and has the command of unlimited water-power from that source; and, considering the very satisfactory nature of the most recent discoveries made, the mine can scarcely fail to become most profitable to the proprietors. Of the neighbouring mines, which also have the water of the river as their motive-power, Cwmystwith is worthy of special remark, as having during the period it has been wrought made immense profits; the yield from the lodes, however, had for years been so easily obtained that comparatively only a very limited extent of ground was ever opened out in depth, and this valuable property, like others in close proximity with it, appears to have been at best but very inadequately developed, especially when it is remembered that more than one immense fortune has been obtained from it by individuals who in turn have become the lessees of the property.

JOHN OWEN.
Bishopsgate street Within, Aug. 8.

SOUTH CONDURROW, AND WHEAL GRENVILLE.

SIR.—In October of last year you did me the honour to publish some remarks of mine upon the above two mines. In my present letter I propose to confine my observations solely to Wheal Grenville. In my letter, dated Oct. 31 last, I called particular attention to the character of the flat lode at each level from the western shaft where a junction of that lode and the old tin lode would occur, and I ventured to give the opinion that so far from any important discovery as likely to take place at the junction, the chances were it would prove a failure. The junction of the two lodes has been reached for some time, and perhaps Capt. Hodge will tell us how far my views have proved correct. A great deal was expected of this junction, and very sanguine opinions were indulged in, but I did not agree with those opinions, and gave my reasons for my dissent; and now that the effect of the two lodes coming together has been seen, I should like to know how far one's judgment has been established by facts. Will, therefore, Capt. Hodge, or any other member of the management, inform us how matters look at the junction?

In a former letter I also said that if the mine were my own I would not lay out another shilling thereon until I had proved certain points at two of the upper levels. I should also like to know how far this opinion, too, has been justified, and if the new 80-in. cylinder pumping engine is able to perform all that was expected of it, or whether it is not still found necessary to keep the old engine at work also? The erection of the new engine just on the border of the boundary of the mine I saw condemned over and over again in the columns of the Journal, and I also saw that at the time the writers were termed "contemptible," but I am of opinion that if the shareholders had listened to your correspondents, and not to the imaginative and verbose speeches which characterised their meetings, it would have been better for their past, present and future welfare. A friend of mine has recently put into my hands the first report issued by the committee in December, 1875. It is very severe upon the former agents, whose discharge the committee strongly recommend; and yet after this recommendation there follows the astounding remarks that "Wheal Grenville is a really sound and valuable property, developed already to such an extent as to be capable by the exercise of a vigorous and at the same time economical management of being shortly brought into a remunerative position." It is more than two and a-half years since this report was published, and I should like to enquire what has been done with a property that came into the hands of the present management in such a favourable and satisfactory position—a position which I consider reflected great credit upon the former agent? Under the present management, of whose extraordinary talents we are reminded quarterly, I think I am correct in saying that 19,640*l.* have been paid in calls, and that over 2000*l.* have been received from the sale of forfeited shares, making, I believe, a total of 22,000*l.* subscribed by the shareholders in two and a-half years. After this enormous outlay, what is the position and prospect of the property compared with that as described by the committee when they accepted their trust? I may show these in a future letter.—Camborne, Aug. 7.

PETER PROVIS.

THE MINERAL CORPORATION OF GREAT BRITAIN, AND PANDORA MINE.

SIR.—The anonymous letter published in last week's Journal, on the subject of a communication I have made to the Pandora shareholders, is so evidently inspired by the present management, and is, therefore, so entirely one-sided in its observations, that it is only necessary for me to say in reply that my statements, and the proposals of the Mineral Corporation, were so favourably received by the Pandora shareholders that a requisition was at once presented to the directors calling upon them to convene an extraordinary general meeting for the purpose of changing the management both in London and at the mine, and that the action taken by one has already received the support of shareholders holding more than half the entire number of shares in the mine. In fact, I find that the great majority of the Pandora shareholders, unlike your correspondent, are very dissatisfied with the "known present," and think that under more vigorous management the "unknown future" may show more profitable results.

To save useless correspondence on the subject of this letter, it may

be as well to state that the offer of the Mineral Corporation was the result of an application to me to raise capital for Pandora. In making this offer it was deemed necessary to add certain stipulations, which will not be departed from. If the shareholders can get the capital elsewhere, and the directors can induce them to remain satisfied with the present management, that is a matter for their decision at the forthcoming meeting. I have placed them in possession of the only terms on which the capital can be obtained from the Mineral Corporation.

JAMES H. CROFTS.

Finch-lane, Aug. 7.

PANDORA MINE.

SIR.—As a large shareholder in this mine, I was very pleased to find that the Mineral Corporation of Great Britain had made us the handsome offer to subscribe for the unallotted capital of the first issue—about 1400*l.*—at a time when our company is almost *in extremis* for want of funds. I was, therefore, somewhat surprised to read the letter of "Not Altogether Blind" in last Saturday's *Mining Journal*, for the writer entirely suppresses the fact of the offer made to us through Mr. J. H. Crofts.

Our directors, although now apparently roused to some life by the action of the French company, have hitherto completely failed to raise the required capital. For some time past I have become completely tired of the state of impasse in which many of the mines in Mr. Murchison's office have reached, and doubtless with many other shareholders in Pandora consider that an expenditure from first to last of many thousands of pounds on the mine since it has been in its present office ought to have resulted in a far different state of affairs than can now be shown.

It is probable, therefore, that for its own protection the Mineral Corporation has stipulated that it will only subscribe for the unallotted shares if a radical change is made in the management. Our present agent has the charge of another mine somewhere in Scotland, and is absent from the Pandora for some days once a month. How is it possible, under these circumstances, to have efficient local management? I understand the mine at the present moment is nearly full of water and all the works are stopped. The offer of aid from the Mineral Corporation, which evidently regards our mine with favour, is, therefore, most opportune, and deserves I think the thanks of all well-wishers to British mining. It certainly has those of—

A LARGE SHAREHOLDER IN PANDORA.

Aug. 8.

PANT-Y-MWYN.

SIR.—I visited this mine on Tuesday, and I am glad to say it is turning out rich, and, so far, has exceeded in point of production the opinions expressed by all who have visited the mine. I merely write this for the information of shareholders who get their mining news through your valuable *Journal*, not being near enough to the mine to know how it is progressing, &c. JAMES YELLAND.

Pontesbury, Aug. 8.

PANT-Y-MWYN LEAD MINE.

SIR.—Having for the last few months taken some considerable interest in the progress of this mine, I ran down to the district on Saturday last, taking advantage of the Bank Holiday on the following Monday, in order to have a look at the property, and to satisfy myself that the various accounts I have received from private individuals, in addition to the numerous letters, &c., which have appeared in your *Journal*, were *bona fide* statements of the merits of the property. The result of my inspection has been to convince me that notwithstanding the success which has been attained hitherto, and the sanguine prospects held out to the shareholders on the basis of the said successes, not one-half, nay, not the tenth, has been told. I am not a prophet, neither the son of a prophet, yet I do not think I greatly err when I predict this property to become in a very inconsiderable space of time one of the most lucrative adventures in the Principality. I might here bear testimony to the attentions I received from Capt. Hughes, who conducted me over the workings, volunteering every information; and my advice to the shareholders is to make a point of visiting the mine personally, when they will see for themselves the value of their property, and what it is capable of producing.

I was informed that during the last twelve months they have sunk 30 yards below the adit level, thus reaching a depth of 130 yards from surface, and they find the lode improves in quality as the depth is increased. Cross-cuts have also been driven 20 yards east and west of Griffith's shaft, and from the former they have a cross to the new lode. The new lode has fully equalled their anticipations, and I believe will surpass any previous discovery. The ore is exceptionally rich in quality to such an extent in fact that very little dressing is requisite. The present output is some 40 or 50 tons monthly, and this it is intended to gradually increase to 100 tons, nor should I think it would be impossible to double the latter amount, inasmuch as the deposit is so abundant and, practically speaking inexhaustable. Considering the present very small capital of the company, there being only some 7500 odd shares issued out of a total of 30,000, the results, taking them at the present figures, cannot but bespeak enormous dividends to the fortunate shareholders, who have every reason to be satisfied with their property. It is my opinion nevertheless, and it is one that I am not alone in, that with an increased number of hands, in order to extend and work the mine with greater rapidity, the total returns would be far larger in comparison to those at present, resulting, consequently, in increased dividends. I await with some curiosity the annual meeting, which I expect will be held at the end of the present month, and I feel assured the report of the management will more than satisfy the most avaricious of shareholders.

Crosby Hall Chambers, Aug. 7.

CORNISH MINING—THE FIVE-WEEKS MONTH.

SIR.—Although to agitate a matter after a decision is arrived at is, perhaps, too much like closing the stable-door after the horse is gone, and becomes of very little interest to anyone, yet in the matter of the Devon Consols and the miners on the five-weeks month I beg leave for a small space more in your valuable *Journal*. In my remarks in the Supplement to the *Journal* of June 22, under the head of "Payment of Miners—The Five-weeks Month," I intended to have added that all contracts with miners should be measured on the last day of each calendar month, Sundays excepted, and not wait for any given or specified Saturday, thereby equalising, or nearly so, one month with another. This is the practice on Lake Superior, which gives both parties (the employer and employed) satisfaction.

I am highly well pleased, however, to find that that trouble is settled. Meantime your advice to Mr. Watson that he should go down to converse with the miners, for a thorough understanding, cannot be too highly esteemed by either the company or men, as the case was very evident that no other course pursued would have produced the desired effect. It is very clear, also, that some people are opposed very much to such course of doing business, as they believe it is levelling the employer down too near to the working man. I am a strong advocate that every man should stand in his own position, and looked up to accordingly, but even so, where is the objection to the employer being seen to have a thorough understanding with the employed so far as their business is concerned? The fact is there is too little of this understanding in Cornwall for the interest of mining. Your correspondent, Mr. Symons, of Truro, seems to believe that Mr. Watson has humbled himself too much by going down to talk with the miners; that he (Mr. Symons) could secure plenty of miners to send up to the Devon Consols to take the places of those who would not work. I have been at mining for 42 years in all its branches, from a boy of 15 years old, working for 9*l.* per month sterling, up to an agent of three different mines at one time, and when I look upon a case similar to the Devon Consols and the five-weeks month I generally try to look at both sides of the question, but your correspondent, Mr. Symons, seems to feel so much disgusted at the idea of the company yielding to the miners in any degree that the poor miner stands no chance with him. Then we might ask Mr. Symons whether a man should cut off his nose in spite of his face?

I wonder if Mr. Symons is a practical miner. If he is, and has

spent much of his time in Cornwall or Devon, he certainly knows the hardships those miners go through, but cannot, or is not inclined to, sympathise with his fellow-miner. If he is not a practical miner, not knowing their hardships, why would or did he advocate the case of the Devon Consols Company so strongly in their favour, and equally so against the miner, when the company themselves were only ten in favour of the five-weeks month, while nine were against it. Even the principal chairman of the company, who has served in that position so many years, comes out very plainly in favour of the four-weeks month, and it is said that "Experience teaches all things." In consequence there is not a doubt that if the principal chairman had been able to take his position on the day of the company's last meeting the trouble would have been settled that day, and the miners returned to work.

A CORNISHMAN.

Lake Superior, July 22.

GREAT DISCOVERY OF SILVER LEAD ORE AT THE BRITISH SILVER-LEAD MINES, NEAR FESTINIOG.

SIR,—I have just returned from visiting the mines, and am glad to inform you that in sinking No. 2 shaft on the main lode we have come upon a splendid run of ore worth 30*l.* per fathom. It is all the more important being only 2 fms. from the surface, and there is $\frac{1}{2}$ mile on the course of the lode to develop, and no doubt exists in my mind that when opened out one of the finest courses of ore in Wales will be the result.

JOHN L. M. FRASER.

ROCK-BORING MACHINERY—SCHRAM'S CLAIMS.

SIR,—Another attack by a writer, signing himself "Delta" (in as bad or even worse taste than "Alpha's" epistle in the *Mining Journal* of July 20), having appeared in the *Mining Journal* of Aug. 3, I beg to publicly state that if "Delta" will give his real name I will at once categorically answer and refute his misstatements, which I hope are the results of his ignorance of the subject on which he writes, and not the outbursts of jealousy. Should "Delta" not respond to this invitation I shall be obliged to use other means to set myself right with the public, and enable the readers of the *Journal* to properly estimate the value of such anonymous correspondence as "Alpha's" and "Delta's." RICHARD SCHRAM.

London, Aug. 5.

P.S.—If Beta, Gamma, and the rest of the Greek alphabet would arrange to insert any remarks they may have to make in the same number of the *Mining Journal*, I might be able to make one reply serve for the lot, and thus be saved much unnecessary trouble.

LIGHT RAILWAYS FOR NEW DISTRICTS.

SIR,—Your correspondent, Mr. Symons, of Truro, some time ago (and in this week's *Journal* there appears to be a want of such in Wales) alluded to the desirability of something of the kind in Cornwall. As uninterested in anybody's make at all allow me to commend to that gentleman and others interested in opening of districts at comparatively little expense the well considered remarks thereon (published by, I believe, Spon, of Charing Cross) by Mr. R. Raper, of Messrs. Ransome and Raper, engineers, Westminster Chambers, Victoria-street, London, and Ipswich, Suffolk, of whom all particulars needed can be had.—*London, Aug. 6.* WEEKLY READER.

(For remainder of Original Correspondence, see to-day's *Journal*.)

Meetings of Public Companies.

SOUTH CONDURROW MINING COMPANY.

A general meeting of shareholders was held at the company's offices, Austinfriars, on Wednesday.

M. H. J. MARSHALL in the chair.

Mr. JAMES HICKIEY (the secretary) read the notice convening the meeting, and the minutes of the preceding one, which were confirmed. The statement of accounts for the 16 weeks, including costs to July 6, were submitted, showing an aggregate expenditure of 6624*l.* 7*s.* 8*d.*, whilst the total returns were 9218*l.* 5*s.* 11*d.*, leaving a profit of 2593*l.* 18*s.* 3*d.* The whole of the liabilities had been paid off, and there was a total available balance now to be dealt with of 4798*l.* 3*s.* 10*d.*

Capt. RICH read the subjoined report upon the position and prospects of the mine:—

Aug. 6.—In making our report on the principal operations of this mine for the 16 weeks since your last general meeting, we regret to state that there has been a further decline in the price of tin of about 2*s.* per ton. Notwithstanding these depressed times we have not slackened our underground works, but have continued to open out on the lode vigorously. The 93 end east is worth 20*s.* per fathom. The 90 end carries low quality tinstone. The 70 end, west of the Plantation shaft, is worth 7*s.* per fathom. A rise in the back of this level is worth 9*s.* per fathom. The 50 end, east of King's, is worth 9*s.* per fathom. A lode in the bottom of the 50 is worth 8*s.* per fathom. The 50 end, west of middle cross-cut, carries stones of tin and has a promising appearance. The 40, east of engine-shaft, is worth 7*s.* per fathom. The 40 west is worth 6*s.* per fathom. The rise in the back of the 40 is worth 6*s.* per fathom. We have intersected the tin lode in the 30 cross-cut, north of engine-shaft; it is not yet driven through, but so far as seen it has a promising appearance, and yields moderate quality tinstone. The 50 end, west of the western cross-cut, is worth 9*s.* per fathom. We have lately set a rise in the back of this lode on the course of the lode, where it is worth 35*s.* per fathom. At the Plantation shaft we have made a communication with the 70. The men are now engaged enlarging the shaft below the 50, so as to make room for a double skip-road. We have also a set of men fixing skip-road in this shaft from the surface to the 50. We purpose making this a good hauling-shaft for the discharge of the tinstone from the western part of the mine. We have recently put out a cross-cut, north of the Plantation shaft, at the 50, and cut the tin lode; at this point it has a fine appearance. We have started to drive east and west of the cross-cut. The lode in each end is worth 20*s.* per fathom. The lode is standing whole to surface above the 50, and we believe it will yield large quantities of tin. The producing powers of the mine are all that can be reasonably desired, but the very low price of metals prevents the making of larger profits.—WM. RICH, WM. WILLIAMS, HENRY ABRAHAM.

The CHAIRMAN remarked that they had heard the statement of accounts for the 16 weeks read, and he thought that considering the continued depressed condition of the metal markets he might fairly congratulate them upon the results which had been achieved. They had heard that although the average price which they had obtained for their tin was but 36*s.* 18*s.* per ton, their returns had amounted to 9218*l.*, which left them a profit of 2593*l.* 18*s.* 3*d.*, out of which the committee recommended the declaration of a dividend of 8*s.* per share, which would absorb 2449*l.* 4*s.*, and thus permit of the addition of 144*l.* 14*s.* 3*d.* to the amount brought forward. At the last meeting the balance was 2204*l.* 15*s.* 7*d.*, so that now after the payment of the 8*s.* dividend proposed the balance carried forward would be 2348*l.* 19*s.* 10*d.*

A SHAREHOLDER enquired whether there was any probability of any rise in the price of tin, which for some time past appeared to have been showing a constant movement downwards.

The CHAIRMAN feared that there was no prospect of an immediate rise, although there was at least one satisfactory feature with regard to the future, that at present the stock did not appear to be increasing so fast. At this time last year the stock, as compared with the preceding year, showed an increase of 1500 or 2000 tons, but this year the increase was only about 150 tons as compared with last.

The report and accounts were then unanimously received and passed; the dividend of 8*s.* per share was agreed to, and the committee of management were re-elected.

The CHAIRMAN remarked that of late their pays at the mine had been by the four-weeks month instead of by the calendar month, which gave a five-weeks month once a quarter; and, as it was most desirable that the financial year should always end at the same date, he would propose that their next meeting be a five-month instead of a 16 weeks meeting, and that it be held on Jan. 2. The dividend which they would then be able to declare would be acceptable to the shareholders, who would at the same time be receiving their Christmas bills.—The motion was unanimously agreed to.

Capt. RICH explained that the operations going on at the 50 would give them 150 fms. on the course of the lode to surface, for nothing had been touched above the 50. He was glad to see the 8*s.* dividend declared, and but for the drop in the price of tin in the last 16 weeks they could have declared 10*s.* They had sold nearly 250 tons of tin and received nearly 2*s.* per ton less than they obtained in the sixteen weeks previously, so they had had to sell a dozen tons more to keep up the 8*s.* dividend. Everything was paid up to last

Saturday, and he never recollects a mine in such a position as to freedom from debt and liabilities. It had been a hard struggle for the last two or three years, nevertheless. Much had been said about miners' work in Cornwall, but he had himself nothing to complain of as to their men; they were well paid, worked hard, and had nothing to complain of either. The men were not responsible for the low price of tin, and he was, therefore, giving them fair wages—as much, in fact, as they would expect with tin at 20*s.* per ton higher.

The usual complimentary vote to the Chairman and committee terminated the proceedings.

GREAT HOLWAY LEAD COMPANY.

The ordinary general meeting of shareholders was held at the offices of the company, Great St. Helen's, on Wednesday,

SIR STEPHEN WALCOTT, K.C.M.G., in the chair.

Mr. EDWARD J. BARTLETT (the secretary) read the notice calling the meeting. The minutes of the previous meeting were read and confirmed.

The accounts to July 22 showed a balance of cash assets of 2492*l.* 8*s.* 11*d.*, and share capital in reserve of 26,695*l.*, without estimating ores on bank.

Mr. BARTLETT also read the following reports from the mine:—

Aug. 5.—I have much pleasure in presenting to the directors my report for the general meeting, and also in being able to state that although we have had considerable difficulty with the water at level engine-shaft, which is hereafter explained, we have made good progress in opening the mine and preparing for future developments. Since our last meeting we have repaired and divided Roskell's shaft, fixed engine, erected house or same, also pithead and capstan, placed the new boring machine in position, and sank 3 yards of the shaft with the same, proving the machine a success. We have not yet, however, been able to continue sinking, owing to the influx of water tapped when driving the 80 east, where we have I think made a great discovery of ore, which had at first not been calculated upon. Some samples of this discovery have been forwarded to you this morning; also other specimens taken from the Office and Partridge shafts. When we commenced to work the level engine the water was drained in 10 days with the 8 inch lift, and on examining the workings below we found a cross-cut had been driven 30 yards north from the engine-shaft to intersect the Holway vein. Also a level parallel with the vein some distance, and another cross-cut from the vein into Roskell's; this having been driven from east to west leaves a fall of about 8 ft. from Roskell's to the engine, so that we can work at Roskell's when there is 8 ft. of water in the level engine-shaft. When, however, anything happens to the engine the water rises, and immediately flows into Roskell's; this has been the difficulty we have had to contend with.

On the eastern side of the vein the old company had driven only a few yards, but our men, with the advantage of dynamite, were able to proceed further, and in short distance intersected a very strong north and south vein. The driving was also continued on the Holway vein, which improved in lead and blende very advanced, and the last time the men were down they reported a great change for the better since the previous day, the vein having opened considerably, containing splendid lead and jack. The increase of water, however, I consider a good indication of a large body of ore ahead of us. We have also raised some lead and blende from the Office and Partridge shafts, but the price for lead being so low we thought it advisable to wait for better times, that the company might derive more benefit from the proceeds. We have also been rising from the adit to communicate with the workings from Garden shaft, where the former company raised a large quantity of rich ore. This operation will open a large stretch of whole ground. The True Blue Mine is on the south side of Garden shaft, and about 50 yards distant from where they are now raising very fine ore. We submit to this party a small portion of our set, they paying us double royalty, and I find that the south portion of the adit level is driven underneath the True Blue vein, so that we may get into the track of their ore. I intend having it dialled and levelled as soon as possible.

Having described as minutely as possible the work accomplished this year, I will now enter upon what is intended for the future. First, we shall endeavour to erect a dam as quickly as possible across the eastern driving from the 80, to prevent the water flowing to the engine, and when this is accomplished there will be no difficulty in sinking Roskell's pit. It is important that this point should be pushed forward, as all our operations depend upon it, and when Roskell's is down to the vein we can see what quantity of water drains into the pit, and act accordingly. It is very probable that the water now troubling us at the 80 east will find its way into Roskell's as soon as the shaft penetrates the vein. It can then be worked dry, together with the ground west, including Partridge. It has been my intention to touch on all the points requiring explanation at your meeting, and although some delays have taken place owing to the strength of the water preventing the sinking of Roskell's as quickly as desired, nevertheless the discovery made will far overbalance this.—W. PARBY.

Aug. 5.—I beg to hand you my report upon the mine, having reference to work done since the last meeting, also present operations and general prospects of the future. Although not altogether satisfied with the progress made at some points, still I am glad to say that which has impeded, or rather retarded, our operations for the present promises us a bright future, for if the influx of water has been difficult to contend with for the time being it has also given us an indication of the treasures we are seeking for. Operations were in the first instance confined to forking the Level shaft with the Level engine, and then sinking Roskell's shaft to intersect the Holway main lode, so that levels might be extended both east and west on the same. Finding after draining that the lode at Level shaft was of a promising character, and made up of everything required for the production of lead, we commenced driving the 80 east, but in so doing cut into water, flowing from a north and south lode; we did our best, however, to contend with it, knowing that if we could find the lode on the eastern side of the cross course we should have a body of lead, and after driving 8 ft. south on the cross course the east and west lode was penetrated, and improved daily, but I am sorry to say we were at last driven from one of the finest lodes any miner could wish to see (specimens of which I send you) by the strength of the water. Our intention at present is to build a dam in the 80, which will enable us to proceed with the sinking of Roskell's shaft.

To give you an idea of this lode, we took from it with the pick the last day but one we saw it 2*s.* 6*d.* of lead of the quality I send you; in fact, the specimens are a portion of it.—Roskell's Shaft: In order to get this shaft down with all speed we erected a winding-engine to which we connected compressors to work the Roanhead boring machine. We have sunk 3 yards, and the boring-machine will, I think, when in proper work, answer well, but in consequence of a water communication between this and level shaft we have not been able to proceed with the sinking as I should wish. Our difficulties I think are now nearly surmounted, however, and with adequate machinery over this shaft, which we have in the water-wheel and connections, we shall be able to extend levels both east and west on a rich lode.—Garden Shaft: Here we are rising up from the deep adit level, and also have a pair of men clearing the old workings from above. This is undoubtedly a fine lode, and has returned large quantities of lead in the section worked, so that when reached we may expect to do well. I have been down there to-day and find a very good lode of lead and blende 8 to 12 in. wide.—Office Shaft: We have a strong lode here, from which some good lead and blende have been raised; indeed, we have heaps on the surface from this place, but seeing the low price of lead we deem it better to wait in the hope of shortly disposing of it to better advantage. The same remark applies to Partridge shaft, so that when Roskell's is down, and the required machinery erected, we shall be able to start Eytoun's engine, which, with that at Roskell's, will dry an extent of ground to enable us to open up the best mines in the kingdom.—J. KEMP.

The CHAIRMAN said: Now it becomes my duty, gentlemen, to move the first re-olution—"That the balance-sheet and directors' report, taken as read, be received and adopted as passed, and be allowed. This is the second time we have had the pleasure of meeting together, and I had hoped I should say something even more encouraging than the reports which we have heard read would enable me to do. Nevertheless the prospects are very good, and I think we shall very soon get a very valuable property in work. I will not occupy your time in going through the items in the accounts, for we have endeavoured to make them as clear and simple as possible, but I shall be happy to answer any question which any gentleman may think proper to put to us in order to elucidate them still further if necessary. We have endeavoured to give you the opportunity of looking at them carefully, therefore if there be anything which strikes you, or if any further information be wanted, we shall be most happy to afford it. The great thing is what are our prospects? Well, in all mining transactions we have various difficulties underground to contend with which no prudence, no foresight, and no precaution can either anticipate or prevent.

In our case the water has been too powerful. However, there have been inventions which enable us to compete with this difficulty more readily and easily than our predecessors were able to do. In their time they had only in gunpowder for acquiring their ore, and inasmuch as the ground was wet and moist gunpowder could not be used with any great success under those circumstances. We at the present day know the power of dynamite, and we have used it, and it enables us to get on.

The great thing is to clear and unwater the mine, and for that purpose we propose, under competent advice, to erect a powerful water-wheel, of which we have spoken all along.

That water-wheel has been purchased, but, of course, it will take time to fix a large piece of machinery in its place, and setting it to work, and when we do that, our advisers in mining tell us that there will be ample power to free the mine from the water to a great depth. Of course, for this purpose we need the assistance of the shareholders in contributing to our means at command for the erection of the machinery required, and to meet the outgoings; therefore, I hope the shareholders will be sufficiently satisfied with the progress which has been made to take some of the shares offered for acceptance, and so put us in ample funds for every contingency. One of the other points I may touch upon is the state of the lead market. Everybody knows that lead, and every other commodity which is produced in this country is selling at the present time at a less remunerative price than it was before the year 1873, when the financial cloud came over the whole of our political and commercial departments, and put a stop to a great many undertakings. However, that cloud seems to be passing off, and I hope by this time next year we shall be in full working, to the advantage of our concern. I do not know that I have any more to say upon our prospects, except that we are doing our best to carry out the undertaking as originally conceived, and we have no doubt in our own minds that we shall very soon have accomplished that object, and be able when we next meet to give you a more satisfactory account than we do at the present time. The only other piece of business is that two directors retire by rotation, according to our Articles of Association, and, being eligible, present themselves for re-election.

The resolution which had been proposed by the CHAIRMAN was seconded by Mr. FEETHAM, and carried.

Mr. E. J. BARTLETT said that those who had become connected with the company had seen the prospectus, and knew the general plan of operations—to unwater the mine, especially at the east shaft and the Partridge shaft, and to get at the ore below the adit level. Before starting the engine at the west shaft it was thought proper to carry out the programme which the old company failed to carry out—to sink the Roskell pit deeper, and erect suitable machinery to relieve the engines at the western portion of the property, which would enable them to have a long stoppage of ground for a number of years. That programme had been attended to, but whilst an engine was being erected over the Roskell pit it was deemed advisable by the managing director to explore at the level engine-shaft to see whether it was true (as reported) that the Holway lode running west and east had not been explored by the former proprietors. After reaching the 80 east from the level engine-shaft they cleared up the bottom, and found lead standing within, and although the former proprietors were unable to explore it this company, by means of dynamite, had been enabled to carry on operations further east upon the course of the Holway lode. After passing a sufficient distance from the north and south lode they found the lead, and the specimens on the table were taken from the forepart of the level. After it had improved, there was an influx of water, which overpowered the small engine at the level pit, and interfered with what might call the major operations at Roskell. Of course, they must regret that the water had so far overpowered them, but, on the other hand, it proved it was no longer a question of speculation as to what they had discovered in the 80 east. They had discovered lead which was exceedingly rich, and which, no doubt, would pay for working even at the present price, and there was no doubt that the discovery was one which would be of great importance in the future. The shareholders might notice that they had only proceeded 3 yards with the sinking of the Roskell pit. That was really the only point of regret in connection with the proceedings of the company. There was a gentleman present who was at the mine last week, and who would testify to the fact that a vast amount of work had been accomplished which shareholders could not appreciate except when the mine came into a profitable state; but as far as the underground working went the only disappointment had been that the deepening of the Roskell pit had not been carried out more successfully; but on the other hand, as he had said, they had made a discovery of great value. Some gentleman had proposed that instead of touching the water-wheel, which had been purchased on favourable terms, they should erect steam power, but the question was whether there was sufficient water finding its way from the adit level to work the wheel. That was a question for the directors to consider; but supposing the wheel was not found to work satisfactorily, they must erect a suitable pump and engine larger than the one they had. It was an old-fashioned one, and an engine could be bought now at a depressed price. The Roskell pit must be driven down quickly, and he regretted it had not been the case to the present date.

Mr. BARTLETT, in answer to questions, said the patent boring machine was answering its purpose very well. The parallel lode had been got at 80 yards from surface, which was an important point.

Mr. ALFRED THOMAS said he could fully corroborate all that the Chairman and Mr. Bartlett had stated. There was no doubt the company possessed a large and valuable area of ore-bearing measures, and the main question was as to the cheapest and most ready means of getting at it. They knew very well that the Eytoun engine and the level engine were not found equal to pumping out the water; and, therefore, it was only reasonable good sense that they must have additional power. The question of utilizing the water-wheel was simply one of engineering skill, and a skilful water engineer would at once be able to say whether the water in the adit level was sufficient to keep in motion a wheel of that kind and lift the water. They must have good and large pumps. He was in doubt himself whether there was a sufficient body of water from

considered the bottom level (the 206) a great improvement to the upper or 192, as would be seen by his report.

The CHAIRMAN replied to the various questions. He deeply regretted the absence of their old colleague, Mr. Greame, through ill-health, although he was pleased to say he was now much better. He was one of, if not the, largest shareholders, and had always taken a deep interest in Tankerville; and, indeed, he must say that during the last twelve months the whole of the directors had given the greatest attention to the company's interest, and but for the fall in the price of lead there would have been a credit balance of nearly 3000*l.* instead of only about 500*l.* He believed, however, that they were on the eve of a better price for lead and lead ores.

Resolutions were then passed re-electing Mr. Greame and Mr. York directors, and Messrs. Brandt and Stansfeld auditors; and, after a cordial vote of thanks to the Chairman for presiding that day, and to the directors, for their attention to the interests of the company, the meeting was brought to a close.

WEST TANKERVILLE LEAD MINING COMPANY.

A private meeting of the West Tankerville Lead Mining Company, a large number of whose shareholders reside in this district, was held at the Talbot Hotel, Wolverhampton, on Thursday, to consider a scheme of the directors for the re-formation of the concern. It was determined to wind-up the present company, and re-form it, and Mr. William Edwards was appointed liquidator. The re-formation will consist in the issuing of 9000*l.* worth of fresh preference shares, bearing interest at 6 per cent., the giving of the present preference shareholders 3000*l.* worth of new ordinary shares in lieu of interest due, and the issuing of a further 6000*l.* worth of ordinary shares to the present holders *pro rata*. The original preference shares bore interest at 15 per cent. The difficulties of the company have arisen from shortness of capital, but their engineer reports that with increased capital the prospects are good, as the mine adjoins the Roman Gravels.

SOUTH TOLCARNE MINING COMPANY.

The four-monthly general meeting of shareholders was held at the offices of the company, Austinfriars, on Thursday.

Mr. C. CLARKE in the chair.

Mr. J. HICKRY (the secretary) read the notice convening the meeting, which was confirmed. The following report was then read:—

Aug. 6.—Since your last general meeting the operations in this mine have been confined to the drawing of the flat-roof shaft and working on the north copper lode, and extending the 38 east and the 24 end west. We have recently passed through the cross-course in the 24; the lode west of the cross-course is composed of fluor-spar, and sometimes good stones of copper are met with. The 36 end east has been extended on the course of the lode 23 fathoms: the ground is easier for driving, and the lode has a strong and kindly appearance. We occasionally meet with rich stones of ore; the quality is very good, but we have not yet discovered ore in sufficient quantities to pay: the indications, however, for further improvement are very encouraging. Taking the depth of the adit into consideration, the 38 is about 70 fathoms from surface, and we would recommend that the speculation be continued as before—the driving of the 38 east and the 24 west. The cost of working is comparatively easy, and a very moderate discovery of copper would soon enable us to work the mine profitably. With respect to the south lode, the operations on the boundary shaft were suspended on account of the water, but the lode at South Condurrow, going west towards South Tolcarne, is looking very well indeed, and will ultimately throw additional light on your property.—W.M. RICH, JAMES KNOTWELL.

The account, after charging 16 weeks' costs to the end of June, showed a balance in favour of the mine of 570*l.* 7s. 8d. A call of 4*s.* per share was made.

The committee of management were re-elected.

A vote of thanks was passed to the Chairman, and the proceedings terminated.

HUNTINGTON COPPER MINE.

The following letter has been sent to the Canadian newspapers by Capt. Warne, who has had charge of the mine for nine years, both under the old and the existing directors:—

Sir.—The Huntington Mining Company, whose varying fortunes give you a good deal of anxiety, was incorporated, I believe, in 1868, with a capital stock of \$600,000. The value of the property was established by the sworn opinion of competent mining authority. Among the original directors were some of the best known and respected men. The mine attracted great attention, and was early regarded as the most promising copper deposit ever discovered in this country. I don't think competition has ever changed that opinion. As mining engineer, I have had charge of the output of this mine all the time for the past nine years—three years under the old company, of which Mr. Huntington was president, and six years under the present Scotch company. The mine has yielded well, and is as good to day as it ever was. The shoots of ore which have already been worked have shown no signs of failure, and if the mining property were further explored there is no doubt that other equally rich deposits of copper ore would be discovered. If Mr. Henderson's chemical process, when applied to the ores, had produced the same results here as it has done, and I presume still does, in Glasgow and elsewhere, and as, therefore, the prospects of the new company presumed it would do here, it is more than likely no shareholder would have had any reason to regret his investment. But it appears large sums of money have been spent in the construction of chemical works which have yielded no return, and worse, have wasted large percentages of valuable product, running the total waste and loss, without giving details here, into the region of many thousands, and it is not wonderful that six years' operations should have brought discouragement. Of course, mining is an adventure. We have to make estimates and take the risks of them. We cannot actually see into the bowels of the earth to the extent of ascertaining values and quantities, but I can give any competent engineer good reasons for my belief that the Huntington mine is a rich and valuable property. I could also give him reasons in detail for other conclusions at which I arrive. Copper fluctuates in value. When the mine was sold to the present company copper was worth 1*s.* to 1*s.* per unit, while now it will only bring from 9*s.* to 10*s.* This is an actual depreciation of one-third in value of the copper only—the sulphur not being estimated. It is not hard for anyone to understand that while the mine could be worked profitably at the first named price, it might be totally impossible to pay running expenses, to say nothing about profit, at the latter price.

For this decline in the market the parties here in Canada who sold the property to the Glasgow capitalists are surely not to blame. I have nothing to do with existing controversies; I think them unfortunate, and I would greatly prefer to see mining in this country conducted strictly on mining principles, and not for political purposes, as seems to have been the case since the present Glasgow companies obtained the mines in this section of the country. And I have only to add, in conclusion, as one who knows whereof he speaks, that you have been grossly deceived relative to the value of the Huntington Mine, and I can easily satisfy any one of the fact who wishes to take the trouble to ascertain. I can speak now, being no longer in the employment of any of the parties concerned. Those calamities are a gross injustice to this portion of the country. We can furnish copper, but one ought not to be held responsible for the failure of others. With fair prices and good management, the Huntington Mine will pay well. It would have been a marvel of wealth if the Huntington process could be applied economically to the utilisation of copper and sulphur, as proposed at the start, by the company. Our business was to supply them with copper, which we have always done as required; theirs was to adopt the chemistry to the utilisation of the products of the mine, in which they have not yet been successful. Does the failure of these processes prove there is no copper in the mine?—Huntington Mines, July 2. W. WARNE.

ENGLISH AND AUSTRALIAN COPPER COMPANY.—At the half-yearly meeting on Thursday the directors will lay before the proprietors a statement of the proceedings of the company for the six months ending Dec. 31. During that period the gross quantity of ore, regulus, and precipitate received from various mines was 9327 tons 1 cwt. 1 qr., as against 7615 tons 18 cwt. 2 qrs. for the corresponding six months of the previous year. The quantity of ore, regulus, and precipitate smelted at Port Adelaide and Newcastle Works was 6773 tons 6 cwt. 3 qrs., as against 5904 tons 5 cwt. 1 qr. The quantity of copper made was 1221 tons 19 cwt. 3 qrs. 5 lbs., as against 1183 tons 4 cwt. 2 qrs. 17 lbs.; and the quantity of copper shipped from and sold in Australia was 1234 tons 15 cwt. 3 qrs. 16 lbs., as against 1171 tons 11 cwt. 2 qrs. 27 lbs. The net earnings of the company's wharf at Port Adelaide were 1877. 13s. 2d., as against 1688. 8s. 11d. for the corresponding half year. At the time of the general meeting held on Feb. 21 the price of Burra Burra copper was 74*s.* per ton; in March it fell to 72. 10*s.*; in April to 71*s.*; in May it reached its lowest point of 69. 10*s.* Since then it has recovered to 71*s.* at which price it now stands. The six months' working to Dec. 31 shows an estimated profit of 2290. 11s. 11d., which the directors have reason to believe will be augmented by the results of the second half year. The reserve fund stands at 10,194. 6s. 9d.

VAL RAILWAY.—The accounts for the six months ended June 30 show that the receipts were rather less than in the same period last year, and the expenditure has increased. The net profit is 340*l.* which, with 538*l.* brought forward, leaves 878*l.* available, from which a dividend at the rate of 4 per cent. per annum is recommended, and 478*l.* is carried over. The line during the six months has been partly relaid with new sleepers.

The NATIONAL DEBT now stands, according to a return just issued, at 777,781,590*l.* During the year 1877-8 the amount of debt created was 7,973,891*l.* but 6,066,008*l.* was paid off. In the past 20 years a

sum of 41,281,738*l.* has been added to the national debt; but, on the other hand, there has been paid off 103,019,468*l.*

Registration of New Companies.

The following joint-stock companies have been duly registered:—

GLOBE TRAMWAYS AND RAILWAY COMPANY (Limited).—Capital 1,000,000*l.*, in 10*s.* shares. To carry on the construction of railways and tramways in all parts of the world. The subscribers (who take one share each) are—Julius Vogel, 127, Cromwell-road; C. J. Kennard, 2, Threadneedle street; H. D. Sindenman, 6, Larater road, South Norwood; R. Fowler, 3, Victoria-street, W.; P. Beau, 1, Emporium's Gate, S.W.; T. S. Tauder, 8, Inverness-terrace, W.; W. Wilson, Dean's yard, S.W.

LEES BROTHERS (Limited).—Capital 112,500*l.*, in 2*s.* shares. To carry on the cotton spinning business of W. and J. Lees, of Albert Mills, Hollinwood. The subscribers (who take 25 shares each) are—W. Lees, Werneth, Oldham; J. Lees, Werneth; John Wilde, Hollinwood; Joseph Lees Wood, the Coppice, Oldham; W. W. Wood, No. 1, Folk-boat, Shefford; T. Lees, Seaforth; J. L. Mayall Lees.

EASTERN SUGAR COMPANY (Limited).—Capital 400,000*l.*, in 10*s.* shares. To carry on business as sugar cane planters and manufacturers of sugar. The subscribers (who take one share each) are—Robert Garnett, Tamworth; A. Bruce, 4, Queen Victoria-street; G. R. Young, 14, Leadenhall-street; R. H. Campbell, Buscot Park, Berkshire; C. Hanbury, Plough court, E.C.; Alfred Muir, Sherborne; R. Toott, 10, St. Mary-at-Hill.

CYPRESS INVESTMENT AND IMPROVEMENT COMPANY (Limited).—Capital 1,00,000*l.*, in 10*s.* shares. The subscribers to this company are—G. Ball, Lark Hall, Clapham; G. Lawson, 7, Draper's Gardens; C. T. Reeves, Wallbrook; F. J. Armstrong, 2, Redcliffe Villa, S.W.; L. Black, 9, Great Winchester-street; W. Perry, Gray's Inn; J. Tatlock, 4, Paper Buildings, Temple.

OSBORNE AND COMPANY (Limited).—Capital 10,000*l.*, in 10*s.* shares. To acquire the business carried on by Sir Charles S. Osborne, F.A.S., of Great Garden-street, Whitechapel. The subscribers are—J. W. Bushby, 3, Halkin street, Grosvenor-place, 50; P. C. E. Rouquette, 35, Finsbury-circus; C. S. Osborne, 20, Ecclesall-square, 10; B. Taylor, Charlotte street, 1; J. Rock, Brookwood, Sussex, 10; H. S. Rouquette, 35, Finsbury-circus, 1; R. Jaggerwell, 26, Medina-road, Clapton.

BAKE COUPLING AND CAN HEATING COMPANY (Limited).—Capital 500*l.*, in 5*s.* shares. To acquire letters patent in connection with the coupling and heating of carriages, &c. The subscribers (who take one share each) are—Harold Brown, 7, Walbrook; H. M. Williams, London and Midland Hotel; J. G. Slater, 69, Upper Thomas street; H. H. McDiarmid, 63, Queen Victoria street; C. F. Mudge, 28, Bedford-place; H. S. Roberts, 5, Pancras Station; C. E. Goss, Argyle square, King's Cross.

BRITISH EXPLOSIVES COMPANY (Limited).—Capital 25,000*l.*, in 10*s.* shares. To acquire an invention for improvements in explosive compounds. The subscribers are—J. W. Treherne, Uphill, Somerset, 26; W. B. Gibbs, Bute Docks, Cardiff; E. Jones, Caerphilly, 2; J. Angel, 4, Mount-street, Swansea, 5; W. Cosslett, Leek with, near Cardiff, 2; John Julius, Cardiff, 1; John Evans, Pentwyn, near Cardiff.

CHEMISTS AERATED AND MINERAL WATERS ASSOCIATION (Limited).—Capital 100*l.*, in 1*s.* shares. To carry on business as mineral water proprietors. The subscribers (who take one share each) are—G. Bird, Crouch-lane, Hornsey; W. B. Edwards, Wood Green; H. Datzel, The Laurels, Beulah-road; T. R. Aneil, 16, Waterloo Bridge-road; Alfred Beal, 13, Dulwich-road, Herne Hill; J. H. Breffitt, 3, New London-street; W. Horsley, Bell and Mouth-street.

Candle, 7*s.*; Uphall, 2*s.*; and Young's Paraffin, 9*s.* In miscellaneous investments Earle's Shipbuilding may be mentioned to pay 7*s.*; Liverpool Rubber, 7*s.*; Miller's Safe, 5*s.*; and Phospho-Guano, 8*s.*

HUNTINGTON COPPER AND SULPHUR COMPANY (Limited).—An addition to the literature in connection with this mine has recently been made in the shape of a letter to the Canadian newspapers by Capt. Warne, who, as mining engineer, has had charge of the output of the mine for the last nine years—three years under Mr. Huntington's company, and the remainder under the present Scotch company. This gentleman reports that the shoots of ore which have already been worked have shown no signs of failure, and if the mine were further explored he has no doubt other equally rich deposits of copper would be discovered. The mine has never failed to yield copper as required, but the company has not yet been successful in adopting chemistry to the utilisation of the products of the mine. Capt. Warne's opinion seems to be that the mine is a good one, but owing to the large sums spent in chemical works which have yielded no return, as well as the fall in the price of copper from 14*s.* and 18*s.* per unit to 9*s.* and 10*s.*, it has hitherto been unsuccessful. With fair prices for the mineral and good management he considers it would pay well.

Subjoined are this week's quotations, &c., of mining and metal shares quoted on the Scotch Stock Exchanges:—

Capital.	Dividends.	Rate per cent.	Description of shares.		
			Per	Paid	per annum.
£ 10	£ 2	2 <i>s.</i>	£ 7	£ 7 <i>s.</i>	Arniston Coal (Limited)
10	10	4	4	4	Benthall Coal (Limited)
100	50	22 <i>s.</i> 6 <i>d.</i>	31 <i>s.</i> 6 <i>d.</i>	31 <i>s.</i> 6 <i>d.</i>	Bolckow, Vaughan, and Co. (Lim.)
10	10	10	10	10	Cairnthal Gas Coal (Limited)
10	—	4 <i>s.</i>	4 <i>s.</i>	4 <i>s.</i>	Chillington Iron (Limited)
10	7	—	—	—	Clyde Coal (Limited)
23	20	10 <i>s.</i> Dec. 1874	10 <i>s.</i>	10 <i>s.</i>	Ebbw Vale Steel, Iron, and Coal (Lim.)
10	8	nil	nil	nil	Fife Coal (Limited)
10	10	nil	nil	nil	Glasgow Port Washington Iron & Coal (L.)
10	10	—	—	—	Ditto Prepaid
10	10	—	—	—	Lochore and Capel-las (Limited)
10	10	nil	3	3	Marbelly Iron Ore (Limited)
10	10	nil	nil	nil	Monkland Iron and Coal (Limited)
10	10	5	4	4	Ditto Guaranteed Preference
100	100	nil	nil	nil	Nant-y-Glo & Blaina Ironworks pref. (L.)
6	6	nil	nil	nil	Omoo and Cleland Iron & Coal (L. & Red.)
1	1	15	15	15	Scottish Australian Mining (Limited)
1	10s.	15	15	15	Ditto New
Stock	100	nil	nil	nil	Shotts Iron
					COPPER, SULPHUR, TIN.
4	4	—	—	—	Canadian Copper and Sulphur (Lim.)
10	7	5 <i>s.</i>	5 <i>s.</i>	5 <i>s.</i>	Cape Copper (Limited)
1	1	7 <i>s.</i>	2 <i>s.</i>	2 <i>s.</i>	Glasgow Caradon Copper Mining (Lim.)
1	15s.	7 <i>s.</i>	2 <i>s.</i>	2 <i>s.</i>	Ditto New
10	9 <i>s.</i>	nil	nil	nil	Huntington Copper and Sulphur (Lim.)
4	4	—	—	—	Panucillo Copper (Limited)
10	10	6 <i>s.</i>	6 <i>s.</i>	6 <i>s.</i>	Rio Tinto (Limited)
20	20	7	7	7	Ditto, 7 per cent. Mortgage Bonds
100	100	5	5	5	Do., 5 per cent. Mort. Deb. (Sp. Con. Bds.)
10	10	22 <i>s.</i>	20	20	Tharsis Copper and Sulphur (Limited)
10	7	22 <i>s.</i>	20	20	Ditto New
1	1	—	—	—	York Peninsula Mining (Limited)
1	1	—	—	—	Ditto, 15 per

have you anything new or good to tell us about the mines?" "Yes, sir," says Tom. "And I'll show you a sample I got from a lode lately that will make one of the richest mines in the country." He then fetched the sample of prian, and handing it to the squire said "Now, sir, did you ever see such a sample as that from the back of a lode? Why bless your heart, sir, it is so rich a sample of prian that it is greasy, like a piece of pork." All in the room were ready to burst with laughing about the pig prian, and the squire, to keep up appearances, said "I am afraid, Tom, you are too sanguine." "No, sir," said Tom, "and I'll take a quarter of the mine, and venture my shirt upon such a sample of prian as that." But the pig prian got wind, and we may hear something more next mitten."—From *Cousin Jack's Unpublished MSS.*

MAGNETIC COMPASSES.

In the manufacture of prismatic or other compasses the bowl or casing is of metal with flanges, leadings, or projections on the exterior, and with other flanges upon the inside below, and under which the edge of the card finds a lodgment in order to give a neat appearance to the article. The card is generally formed of an enamelled plate or disc of insulated metal, or of talc, on which the printed and divided sheet is pasted, and with the magnetic needle upon its under face, by which its magnetic readings can be observed when looking from above. In the case of prismatic compasses, the card is formed of a metal ring with a cross bar, by which the card is suspended on a "centre" that it may turn freely thereon, and find its own direction of polarity when released from a catch plate, which is caused under the pressure of a knob to press against its edge, and thereby hold it firmly when desired. The top face of the ring is divided, or has a degree scale marked upon it, to enable the readings to be taken when desired by a hair line in a hinged flap piece, which can be arranged vertically, so that the shadow of the hair line from the sun-light may be cast across the face of the scale, the reading off operation being made by a small lens fitted on the edge of the casing for the purpose. These prismatic compasses, although of a convenient size for carrying are of unnecessary weight; they are also expensive by reason of the engraved scale upon the face. The cards require extra care in centreing, and the "point" has to sustain a weight which diminishes the sensitiveness of the card to turn thereon. These objections to compasses generally are great drawbacks to their universal adoption, added to the card's sensitiveness to enlarged outside magnetic influences which often set the needle several degrees away from the normal or true magnetic point.

By the invention of Mr. A. C. FRASER, of the Strand, these objections and inconveniences are obviated; the magnetic power, or polarity of the card or needle, is insulated from outside surrounding influences; consequently, a more correct reading can be taken than under existing circumstances. The compass bowl or casing is of considerably less weight, as is also the card. The division lines and figures on the card are more defined and more easily read, even without a lens or magnifying glass than with one of present construction. The shadow of the hair line is more bold and distinct, and the article, especially as a prismatic compass, is superior in every sense. For the purposes of his invention, he makes his compass bowl or casing of black hard rubber moulded into shape with a bulb in the centre of the bottom piece, into which the point or centre stem is embedded; on this he mounts a card of printed paper (tinted) pasted upon an aluminium disc or plate, whose outer edge projects beyond the edge of the paper to take the pressure of the spring plate (shaped to correspond), when the card has to be temporarily fixed for the reading to be taken, he forms a lip rim around the top edge of the casing, in or on to which he cements or screws a lid or top, this having a V-shaped aperture in it, and provided with a glass through which the reading can be taken, and across which the shadow of the hair line from the sun's light can be seen very distinctly. The adaptation of hard black rubber as an insulator, and moulded to shape in conjunction with an aluminium base to compass card having printed divisions on tinted paper, from which magnetic readings can be taken, said casing having a glass in its lid as described, forms a new article of commerce of great value.

ROTATIVE WATER-PRESSURE BLAST-ENGINES.*

This engine, horizontal and direct-acting, was constructed to the designs of Messrs. Taws and Hartman, for the Longdale Iron Company, Virginia, to supply blast for a coke furnace. There is a pair of blowing cylinders, 48 in. in diameter, to each of which an 18 in. water-cylinder is connected direct, with a stroke of 5 ft. The admission and discharge valves for the water-cylinders are 18 in. in diameter, equal to the diameter of the cylinders, conducive by their largeness to steadiness of motion. The valves are moved by means of ordinary eccentrics and rods. The two engines are coupled to one crank-shaft, carrying two fly-wheels. The water is taken from a dam having a head of 65 ft., from which the available supply is ordinarily about 6 cubic feet per second, through a plate-iron flume 30 in. in diameter. The main supply-pipe, ending with a diameter of 24 in., is terminated by an air-vessel 2 ft. in diameter and 9 ft. high. A branch is taken to each water-cylinder, and carries an air-vessel 10 in. in diameter and 9 ft. high. The exhaust water is discharged by a pipe into the waste water-way, 13 ft. below the cylinders, making a total head of (65 + 13 =) 78 ft.

The engines make twelve turns per minute, noiselessly and without shock; speed of piston, 120 ft. per minute. The pressure of the blast is 3½ lbs. per square inch. It is shown by indicator diagrams that the pressure in the water-cylinder is steady and constant throughout the stroke; and that during the exhaust it falls to a pressure of 5.625 lbs. per square inch below the atmospheric line, equivalent to 13 ft. of water, the actual fall below the cylinders. The efficiency of the engines as originally made was calculated as 84 per cent. But the water-cylinders have recently been lined, and reduced to a diameter of 15½ in., making twelve turns per minute, and giving a blast of 2½ lbs. per square inch. The efficiency has thereby been reduced to 79 per cent. The furnace supplied by the blast is 11 ft. in diameter at the boshes, and 60 ft. high, with a closed top; and yielding from 130 to 150 tons of coke-pig per week.

* By W. JONES: *Journal of the Franklin Institute.*

LOCOMOTIVE IMPROVEMENT, AND RAILWAY ECONOMY.—A mechanical error "involved in the present mode of applying the engine power to driving wheels" is pointed out by Mr. G. BEESLEY, C.E., of St. Paul's-road, Kennington, who maintains that "the backward strokes of the engines being in direct opposition to the onward movement resist the advance of the locomotive." Although all engineers do not entertain precisely the same ideas as Mr. Beesley, there is no reason why he should not endeavour to make his back strokes in the direction in which the engine is running, especially if he can overcome the mechanical difficulty of getting both back and forward strokes in the same direction. Mr. Beesley considers that by cutting off the steam during the back stroke only half the steam will be required for equal distance, and that 60 per cent. of fuel will be saved, and that the whole annual expenditure of railway companies will be reduced to the extent of 15 per cent. He offers specially reduced royalty to those who will give his invention a trial on the working scale.

THE CARNARVONSHIRE SLAB COMPANY.—In the Chancery Division on Saturday, before Sir R. Malins, Mr. Chester applied for an injunction restraining the landlord of the quarries and works of which this company are the tenants from distraining for rent due under the lease. It was understood that a petition had been presented for winding up the company, but it had not yet been heard, and that the rent in respect of which the application was made had accrued due before the presentation of the petition.—The Vice-Chancellor made the order sought for.

THE EMMA MINE.—Application having been made, before the Master of the Rolls, in the matter of the Emma Silver Mining Company v. Grant, to discharge an order for the examination of Prof. Blake, who had reported on the mine previous to the company's purchase, the motion was refused.

SELF-MOVING ENGINE AND STONE-BREAKER.

FIG. 1.

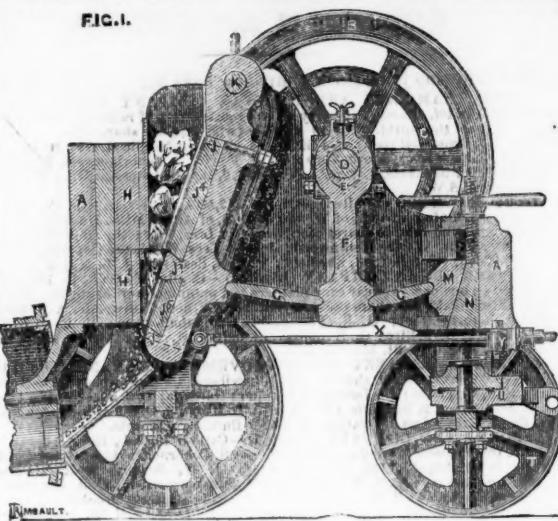


FIG. 2.

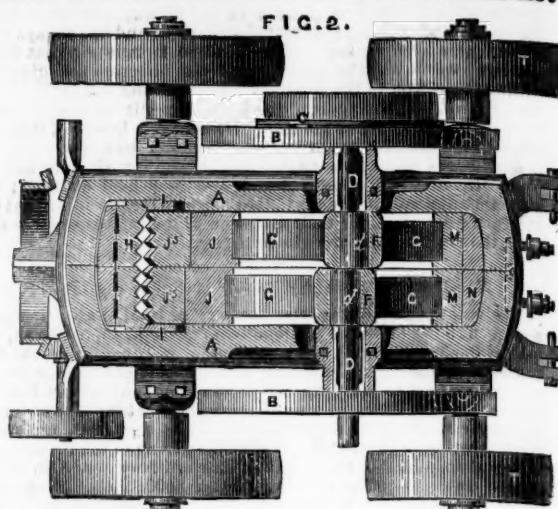
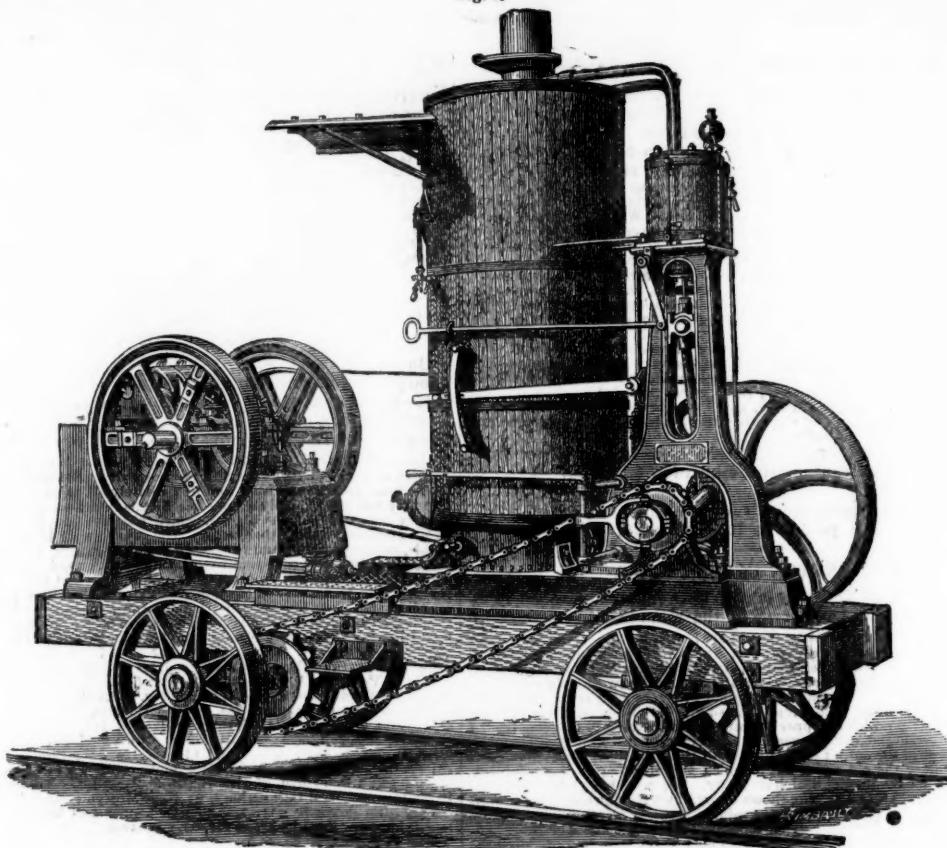


FIG. 3.



SELF-MOVING ENGINE AND STONE BREAKER.

An important piece of machinery connected with the preparation of ore for market is at present being introduced by the Savile Street Foundry and Engineering Company of Sheffield—a self-moving engine and stone breaker—the advantage of which is that the machinery can be taken to the work instead of the work having to be brought to the machinery. The novelty consists in arranging upon a trolley a stone breaker, with an engine and boiler detached, capable of independent use in driving a saw bench, crushing rolls, centrifugal and other pumping machinery, and for use on temporary lines for hauling purposes. The whole machine is self-moving on an ordinary contractors' rail at the rate of 2½ miles per hour, and with a 6-horse power vertical engine and boiler a 16 in. by 7 in. stone breaker will reduce from 50 to 60 tons of stone per day to a size most convenient for further treatment; whilst the machine can be slowly moved forward to receive the unbroken stone from either or from both sides. The principle of the machine following up the work as it proceeds is opposed to the present practice of bringing all the work to the machine, but possesses many advantages, especially when the mineral to be treated is raised in large quantities from several shafts; for it frequently happens that abundance of materials are excavated which, although of small value, would be worth treating, owing to the saving of a large amount of hauling, and because by once handling it could be dropped into the machine and prepared for any purpose, as the materials may be run into ordinary trucks or handbarrows placed between the metals. For temporary pumping, hoisting, or winding the engine may be used with a special pulley in addition to the fly-wheel always provided on the engine. Link-motion reversing gear is supplied to run the engine either way and for shunting, and a clutch gear arrangement with lever is supplied for moving the whole from place to place. The stone breaker being entirely self-contained, can be erected and permanently fixed for the work if required, whilst the engine and boiler being contained upon a cast-iron foundation are available for any work where an engine is required. In the engine the working parts are got up bright; ample wearing surfaces and adjustments are provided; a highly sensitive governor driven by a belt and operating a balanced valve renders it perfectly under control. The boiler is of the vertical type, with Low Moor iron fire-box and circulating water tubes, large heating surface, and tested up to 120 lbs. per square inch. The travelling wheels are wrought-iron, with turned wrought-iron tyres, and the gear is of cast-iron, except the clutch gear.

In the above diagrams Figs. 1 and 2 represent the stone breaker, and Fig. 3 the engine and breaker combined and ready for use. The breaker is constructed upon Hall's multiple action principle, the distinctive feature of which is the splitting up of the working jaws, J, which are each actuated by a separate eccentric, d, forged on the multiple eccentric shaft, D, operating a connecting rod, F, and distinct set of toggle plates, G. The eccentrics and motion work are so placed as to balance each other, so that one jaw only is operating on the stone at the same time, although each jaw makes one stroke during each revolution of the main shaft, D, so that in a machine making 250 revolutions per minute, and having two working jaws suspended from the fulcrum shaft, K, the total number of vibrations would be 500, which would reduce the strain on the machine at any time to exactly one-half the strain that would have to be provided were both the working jaws brought into action together. The inventors claim that they increase the number of strokes but proportionately decrease their intensity, and by placing the working jaws in equilibrium save power, reduce the chances of breakage, and run more steadily than a single-jaw machine. The withdrawal of the working jaw on the completion of the stroke is effected by using Hall's patent draw-back motion, which consists in coupling

the rods, X, of the jaws by a cross lever, Y, mounted on a stud at the end of the machine, thereby causing the advancing jaw to withdraw the other jaw. The power to compress a spring sufficiently strong to effect the withdrawal of the jaw in the machine 250 times per minute is considerable, and this is saved in Hall's machine. It is claimed that as to the construction of wearing faces, and to the cubing jaws invented by Mr. Hall, they are entirely different from anything before submitted. The moving jaws, J, have a raised projection, J', which is chilled on the top, cast across the face; this is undercut at each side, and suitable faces let in, and held at the top at J' and bottom J, by wedges or wedge-shaped bolts, which can be easily tightened without removing any part. The fixed jaws are also made in two, and each particular section or face can be reversed so as to present two wearing surfaces. It is well known that the wear is most rapid at the lower end of the working jaw, and this is the smallest of the renewable faces in Hall's machine; so that one set of top faces will wear out two or even three sets at the lower end. Hitherto the principal wear has also been down the centre of the jaws respectively, for the simple reason that no effort has been made to spread the wear over the whole surface of the jaw; the opposing motions of Hall's patent jaws have the tendency to spread the stone immediately over the whole acting area, securing an even wear.

CORNISH PUMPING ENGINES.—The number of pumping-engine reported for June is 16. They have consumed 2116 tons of coal and lifted 16.5 million tons of water 10 fms. high. The average duty of the whole is, therefore, 52,400,000 lbs. lifted 1 ft. high, by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:

	Millions
Dolcoath	58.8
Mellanear	56.2
West Basset	56.0
West Wheal Frances	55.8
West Tolgus	57.0
West Wheal Seton	72.1
West Wheal Seton—Harvey's 85 in.	75.4
West Wheal Seton—Rule's 70 in.	75.4

FURNACES FOR HEATING AIR.—In order to utilise heat as much as possible, and so to economise fuel, Mr. W. F. NAST, of St. Louis, Missouri, proposes to arrange four fire-grates in the lower part of a brick structure, and above these he provides a space within the walls, which space he divides by vertical partitions into four compartments. A flue from each of the fire-places opens into one of these compartments. By a series of floors he divides the said compartments into successive storeys, one above the other, and he stops each of these floors short at some distance from each end of the chamber alternately, so as to give passage upwards for the products of combustion, which thus are made to flow from the fires in a zig-zag direction along the successive storeys of flues to a chimney at the top. In each of the flues thus formed he lays an earthenware or refractory pipe, and he connects the pipe lying in the one storey of flue with that in the next below by a bend which passes through the opening above mentioned from flue to flue. By means of a fan or other suitable instrument he forces into the uppermost series of pipes air, which, flowing along the successive storeys of pipes in a direction opposite to that of the products of combustion, along the exterior surfaces of the pipes, and thus becoming more and more heated in its course, finally issues by a pipe or channel from the lowest of the flue pipes. By this arrangement the products of combustion in their course through the flues come in contact with colder and colder portions of the pipes, and before they issue by the chimney have the greater portion of their heat thereby extracted from them.

STEAM-ENGINES FOR TRAM-CARS.

That steam will ultimately displace horse traction on tramways can scarcely be doubted, although it is probable that further improvements in tram-engines will still be made. The subject is receiving the careful attention of inventors, and Mr. H. W. WIDMARK, of Bristol, appears to have been to some extent successful. His invention has mainly for its object to provide propelling apparatus for tram-cars which shall require but little attention and the expenditure of a small amount of steam, and shall also get rid of the noise caused by the exhaust steam issuing in puffs when set free by the slide valve, and escaping from the cylinder at a higher pressure than the atmospheric pressure. By Mr. Widmark's arrangement the steam pressure will be so much reduced before the steam is allowed to escape that it will be near atmospheric pressure, and, consequently, will escape without the distinct puffs before mentioned; the steam also will be expanded to the atmospheric pressure, instead of being allowed to escape at high pressure, and this expansion will give more power out of the same quantity of steam. The boiler required will, therefore, be less, and the weight of the tram-engine reduced.

In some steam trams constructed the steam has been made to escape, first, into a reservoir, where it has partly expanded before going into the chimney; but even then the escape has not been continuous, and the final pressure in the cylinder has been lost for power. Mr. Widmark proposes to provide on the engine to each cylinder another large cylinder on the compound principle. This cylinder might either be in the same line as the small cylinder, and have its piston on the same rod on the continuous expansion principle; or the large cylinder might be in another plane with its piston rod, in connection with the crank axle by a separate connecting rod. Or he provides only one large cylinder for the two small cylinders to expand into. Then there will also be a separate connecting rod and piston rod. Or he has only two cylinders, one large and one small, the large one taking steam only from the small cylinder. Then the respective cranks will be set at right angles. In any case he provides a valve on the valve chest of the large cylinder, or a valve on each end of the cylinder, to open inwards and admit air behind the piston if the pressure should by expansion or by less admission into the small cylinder have fallen so low that in further progress of the piston the pressure would be less than the atmospheric pressure. A partial vacuum would without these valves often occur, and would create a pressure on the piston in the wrong direction. By these valves the pressure in the cylinders can never be lower than the atmospheric pressure. When the piston turns and progresses on the return stroke the mixture of steam and air escapes through the exhaust port into the chimney in a continuous stream without noise.

It is claimed that by these means less steam will be required for driving the engine, and if a boiler is provided having a great quantity of water over the fire-box and tubes, and a large surface to the water, the water level will not fall rapidly when the engine is working, nor will great attention for feeding be necessary. The driver, acting also as stoker, will therefore be enabled to leave the boiler during the trip, and only attend to stoking and feeding at the ends and during stoppages. With a great quantity of water in the boiler the pressure will also during the working be more constant. Also, as there can be no blast from the exhaust steam, the pressure of which has been reduced, it is necessary that the flue or tube areas of the boiler should be large, so that they do not much obstruct the products of combustion, rising only through the natural draught by means of the chimney. To gain these objects he uses an upright boiler, with an internal fire-box. The upper portion of the shell he enlarges, and makes a smoke-box, as a ring, to go all round the lower part of this enlarged portion. From the upper part of the internal fire-box tubes go radially and in several rows as to the height; their outer ends are fixed in the enlarged shell, where the ring smoke-box receives from them the products of combustion, which afterwards are led into the chimney by pipes or by another set of tubes returned into the fire-box, into an upper compartment divided off by fire-bricks from the lower portion. From this upper compartment an internal tube takes the products into the chimney.

PUDDLING AND HEATING FURNACES.

The invention of Messrs. DEELEY and GARBETT, of Brierley Hill, consists of improvements in the construction of puddling and heating furnaces and other furnaces used in the manufacture of iron and steel, and also in steam boiler furnaces, whereby a portion of the gases ascending the stack or chimney of the furnace is returned to the fire-place part of the furnace, and there mingling with the fresh air re-enters the furnace. By this arrangement part of the gaseous matter leaving the furnace by the stack or chimney is passed a second time through the furnace, and any unburnt fuel contained in it is utilized.

To describe the invention as applied to a puddling furnace used in the manufacture of iron and steel it may be stated that near the top of the furnace stack or chimney, and on opposite sides thereof, they make two openings, and in the sides of the furnace near the fire-place end they make two openings. The openings in the stack they connect with those in the sides of the furnace by pipes or tubes, preferably of sheet-iron. At convenient points in these tubes they place dampers or valves, by which the said pipes can be more or less closed at pleasure, and the quantity of gas passing through them regulated. By the combustion in the furnace a powerful ascending current of the products of combustion and gaseous matter from the furnace is produced. This gaseous current when the damper at the top of the stack or chimney is raised to its full extent, passes into the atmosphere, but when the damper at the top of the chimney or stack is lowered so far as to obstruct more or less the ascending current part of it descends the tubes described and re-entering the furnace any unburnt gaseous fuel contained in it is burned.

One great advantage claimed for the invention is that by its use a considerable saving in fuel is effected. The dampers or valves in the tubes in conjunction with the damper at the top of the chimney or stack give the workmen complete control over the working of the furnace. Although they prefer to employ two pipes for receiving the gaseous matter from opposite sides of the stack near the top, and for delivering it into the furnace at opposite sides, yet they do not limit themselves to the use of two pipes nor to the precise points at which the gaseous matter is taken from the stack and delivered into the furnace, as these details may be varied to suit the particular furnace to which the invention may be applied. The application of the invention to furnaces used in the manufacture of iron and steel other than puddling furnaces, and its application to steam boiler furnaces, differs in no essential respects from its application to puddling furnaces.

HEATED BEARING SIGNAL.—The invention of Count ADOLFO COZZA, of Orvieto, is for the purpose of causing the temperature of shafts, axles, and such like, or of the journals and bearings of same, to register itself or give alarm, or otherwise indicate to one or more parties interested the temperature of such materials when it reaches a certain degree, and consists in the use of one or more materials, the density of which is altered when submitted to a certain amount of heat, and by such alteration actuating one or more levers, wires, or other attachments in electrical contact or otherwise with a dial or indicator furnished with an alarm. The improvement may be performed in some cases by fitting in a convenient receptacle made in the journal, one or more pieces of metal or alloy of any shape, fusible at high temperature. When the temperature reaches a certain amount the metal fuses, and the pieces of metal being conveniently wire-shaped and attached to an alarm, said fusing breaks the contact and the alarm is sounded. And in some cases the metal wire may be passed through or by the journal or shaft, said wire being in electrical contact with a suitable machine generating electricity on a certain heat being obtained, the metal wire will expand and break contact, and thus sound an alarm arranged for the purpose.

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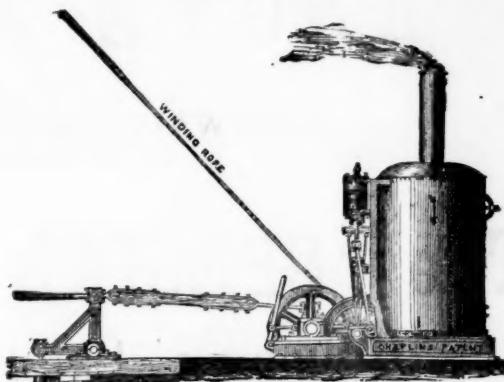
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AND 10, MARSDEN STREET, MANCHESTER.

Prize Medal—International Exhibition, 1862.

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FOR PUMPING AND WINDING.
SIMPLY ADAPTED for PITS, QUARRIES, &c.
SIMPLE and STRONG; require NO FOUNDATION or CHIMNEY STALK, and are EASILY ERECTED or REMOVED.

Sizes, from 2 to 30-horse power.

Steam Cranes, 1½ to 30 tons, for railways, wharves, &c.; hoist, lower, and turn round in either direction by steam.

Stationary Engines, 1 to 30-horse power, with or without gearing.

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Contractors' Locomotives, 6 to 27-horse power.

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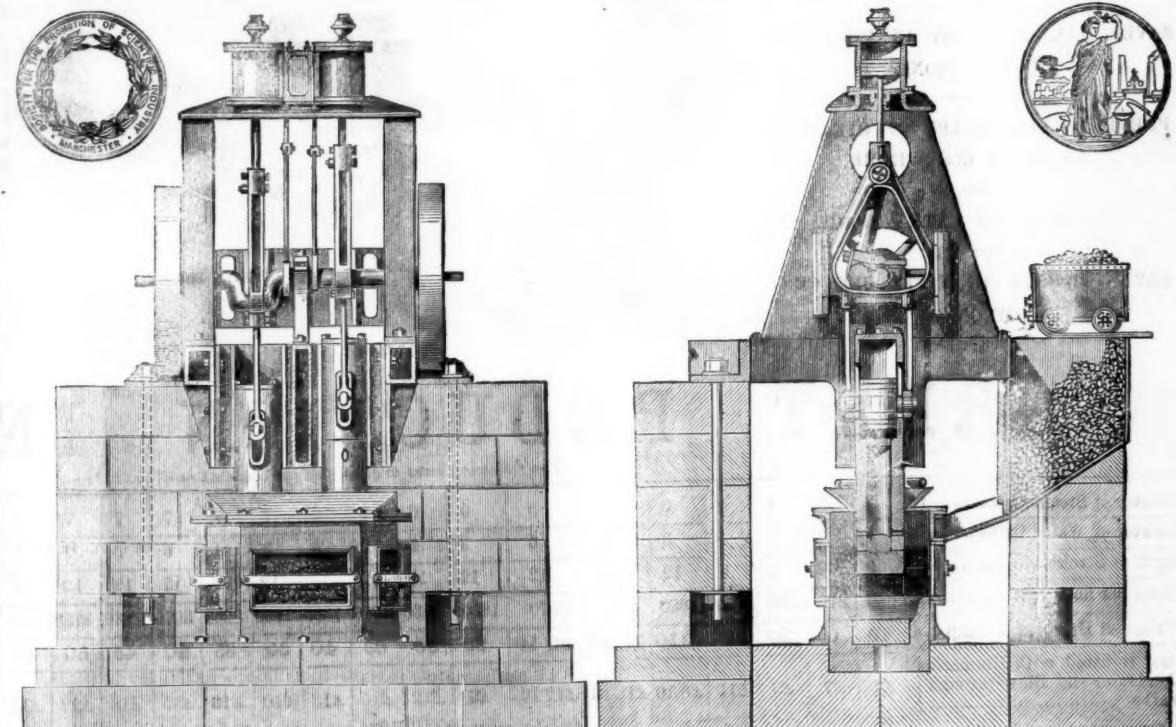
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PNEUMATIC STAMPERS,

For Pulverising Tin and Lead Ores, Gold Quartz, &c.,

SOLE MAKERS FOR CORNWALL,

N. HOLMAN AND SONS,
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All objectionable features of "wear and tear" common to the original and existing Pneumatic Stamps (driven by belts) are removed in this patent, and leather glands and stuffing boxes entirely dispensed with, the pneumatic piston being reciprocated into the compressing chambers by direct-action from without. These double machines are guaranteed to be of the capacity of 36 ordinary heads of cam and lifter stamps, and engineers will at once see that, inasmuch as the power is directly applied to its work (without the medium of belts and other gearing), the minimum consumption of coal (all other conditions being equal) must be the result.

The COST OF THESE MACHINES (including boiler) is about ONE-THIRD OF THE ORIGINAL CAM AND LIFTER STAMPS, to do the same work.

ROTARY STAMPERS SUPPLIED ON THE SAME PRINCIPLE, WITHOUT STUFFING BOXES OR GLANDS, WHERE RUNNING GEAR EXISTS, OR WITH HORIZONTAL CONDENSING ENGINES AND BELTS TO DRIVE THEM, IF PREFERRED.

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After eight years of successful application for all purposes to which steam-driven pumps can be applied, THE "SPECIAL" STEAM PUMP STILL MAINTAINS THE FIRST POSITION IN THE MARKET, notwithstanding that it alone—of all direct-acting pumps—has been subjected to the great variety of severe tests that must be encountered in such a period of time. Some valuable improvements have been suggested in the course of a long experience, and their adoption has rendered the apparatus at once the simplest and most certain in action. There is absolutely no extraneous gear, and the steam cylinder is no longer than the pump. The valves are of easy access, and are suited for pumping fluids and semi-fluids of almost any consistency.

Holman's Condenser

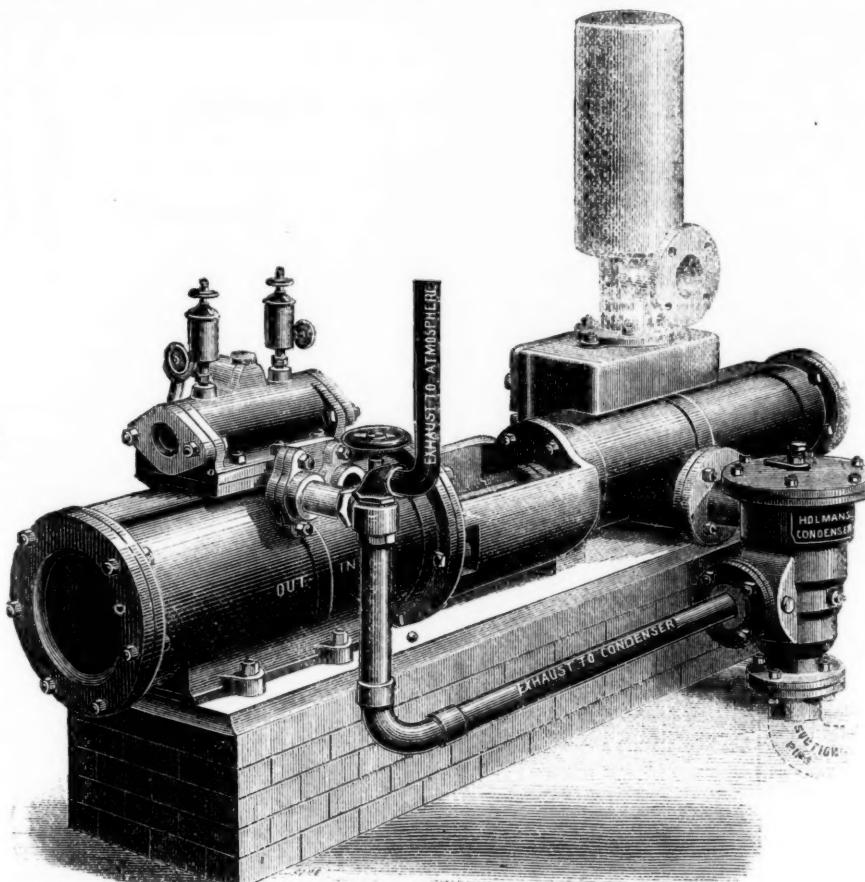
TONS WASTE STEAM INTO
GREAT POWER.

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PREVENTS ALL ESCAPE OF STEAM IN
MINES OR ELSEWHERE.

REQUIRES NO EXTRA SPACE.

SAVES TWENTY TO FIFTY PER CENT.
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WILLIAM ELLIOT, Esq., of the Weardale Iron and Coal Company, writes under date Sept. 17th, 1875, as follows:—“We have now THIRTY-FIVE of your SPECIAL STEAM PUMPS in operation at the various collieries under my charge—some of them employed pumping water out of our pits to the depth of 50 fms.—others employed in the pits, and a good many feeding Boilers. I have no hesitation in saying that we have found them the Cheapest and Best Pumps of the kind we have tried. I can with confidence recommend them to intending purchasers.”

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HOLMAN'S CONDENSERS

Are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only is the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

GREAT REDUCTION IN PRICES.

The following sizes are suitable for low and medium lifts:—

Diameter of Steam Cylinder ...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	9	9	9	9	10	10	
Diameter of Water Cylinder ...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	5	
Length of StrokeIn.	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,500	
Price of Special Pump ...£	16	18	20	25	22 10	27 10	32 10	25	30	35	40	30	35	40	45	50	40	45	50	55	65	50	55	60	70	85	55
Extra, if fitted with Holman's Condenser and Blow-through Valve	£7	£7	£9	£11	£8 10	£11 10s	£12 10s	£9	£12	£15	£15	£10	£13	£15	£16	£22	£13	£16	£16	£22	£22	£16	£16	£23	£24	£35	£17

CONTINUED.

Diameter of Steam Cylinder...In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	16	18	18	18	18
Diameter of Water Cylinder...In.	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14	
Length of StrokeIn.	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	
Price of Special Pump...£	65	75	90	100	75	80	85	110	120	140	110	120	130	140	160	180	140	150	160	180	200	180	190	210	230	
Extra, if fitted with Holman's Condenser and Blow-through Valve	£23	£24	£35	£35	£20	£27	£27	£38	£38	£50	£28	£28	£40	£40	£55	£28	£40	£40	£55	£55	£45	£45	£56	£60		

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36, 48 and 72-inch Stroke.

The following Testimonial gives one Example of the Power Gained by the action of Holman's Patent Condensers:—

NORLEY COLLIERY, WIGAN.

Messrs. TANGYE BROTHERS AND HOLMAN.
GENTLEMEN.—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economic sense, a most valuable feature in the drainage of underground work-

ings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10½ lbs. per square inch, even when we run the Pump upwards of 80 strokes (106 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 84 strokes (168 feet) per minute, the steam gauge

indicating a steam pressure of 36 lbs. per square inch, 80 yards from the Pump, and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The working economy thus shown is really so great that the cost of the Condenser must be saved in a very short time.

(Signed)

J. THOMPSON.

AWARDED THE PRIZE MEDALS AT LEEDS, MANCHESTER, AND WREXHAM EXHIBITIONS, 1875 AND 1878.

HADFIELD'S STEEL FOUNDRY COMPANY,

ATTERCLIFFE, SHEFFIELD,

DEVOE THEIR EXCLUSIVE ATTENTION TO THE MANUFACTURE OF

CRUCIBLE STEEL CASTINGS, for Engineering and Mining Purposes,

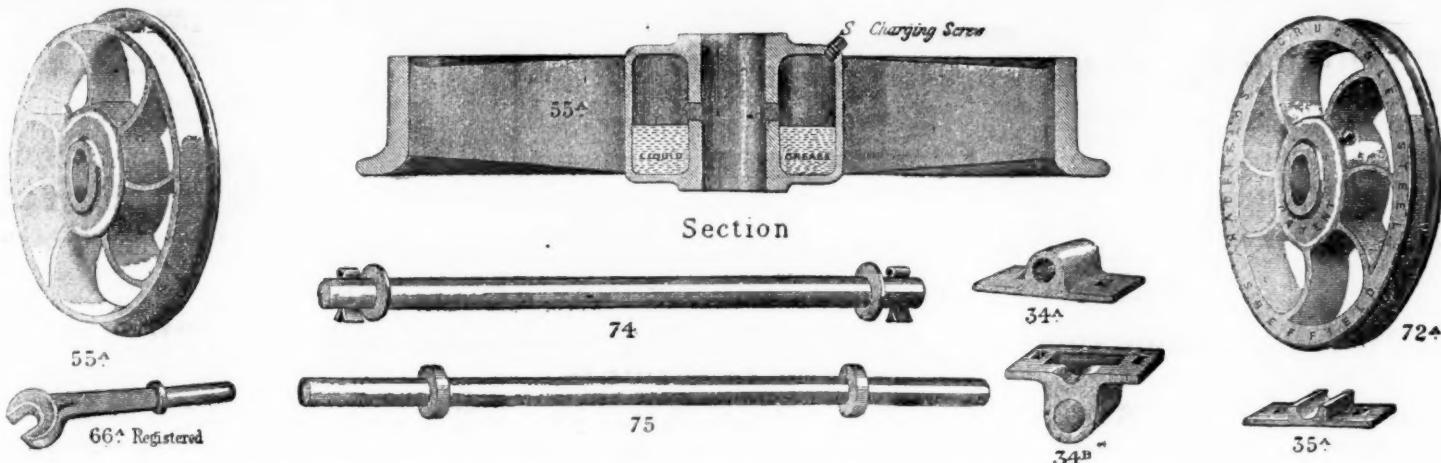
AND ARE THE SOLE MAKERS OF

Hadfield's Self-oiling Steel Wheels

(PATENTED).

These possess advantages held by no other wheels, and are specially adapted for Collieries, Ironstone Mines, Slate Quarries, Lead and Copper Mines, &c., &c., where LOOSE Wheels are used (*i. e.* those revolving upon their own axles). By the old system of lubricating loose wheels, it is well known this is attended with constant labour and excessive waste; and as so little of the grease or oil applied reaches the wearing surfaces, and as re-greasing can only take place at fixed parts of the workings, the bosses of the wheels and bearings of the axles soon become dry, and cut each other: thus causing enormous wear and tear, and necessitating extra labour, haulage power, and expense. These and numerous other defects are entirely remedied by these wheels, as will be readily seen from the following illustrations and advantages claimed.

N.B.—Price per Set of Wheels and Axles (ready for use) forwarded on receipt of—1. Diameter of Wheel on tread. 2. Width of tread. 3. Diameter and total length of axle, also whether No. 7½ or 7. 4. Rail gauge. 5. Rolling load.



This Advertisement is varied from time to time.

The following are a few of the numerous Advantages claimed by the above Self-oiling Wheels:—

- 1.—Two-thirds (at least) less grease or oil is required than at present used by any known method of lubricating Mining Wagons, whether by hand, machine, or otherwise.
- 2.—These wheels effect a very great saving in haulage power; also wear and tear—being so constructed as never to allow the bearings to become dry. The revolving of the wheel leads out the oil required, and immediately the wagon stops the lubricator ceases its action.
- 3.—No waste of grease can occur, no matter in what position the wagon may be placed, when discharging its contents (even if up side down); and when the wagons are not in use it is utterly impossible for any grease to escape, as it is all stored below the outlet (as shown above).
- 4.—When once these wheels have been charged with liquid grease (which can be done by any inexperienced person) they do not require any attention or re-greasing whatever for several weeks or even months afterwards, in proportion to the distance travelled.
- 5.—These wheels can be readily fixed to any description of either wood or iron corves now in use, whether the wheels are upon the inside or outside of the frame.
- 6.—They are exceedingly simple in construction, have no detail, and are not liable to get out of order.
- 7.—They possess great strength, durability, and extreme lightness, being made of CRUCIBLE STEEL.

Where FAST Wheels and Axles are adopted instead of Loose ones, as shown above, see our Illustrated Sheets of Drawings Nos. 2 and 3 of Crucible Steel Wheels and Axles, fitted complete by Hadfield's Patent Method, and Hadfield's Self-oiling Pedestals.

HARRIS'S PATENT WROUGHT-IRON WINDOWS.

DOME AND OTHER ROOF LIGHTS, FLOOR AND PAVEMENT LIGHTS, ETC.

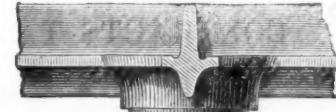


GREAT BRITAIN,
UNITED STATES OF AMERICA,

ARE STRONGER, SUPERIOR, AND CHEAPER
THAN ANY OTHER METAL SASHES YET
PRODUCED—COST LESS FOR GLAZING—
ARE AS CHEAP IN MANY CASES AS WOOD

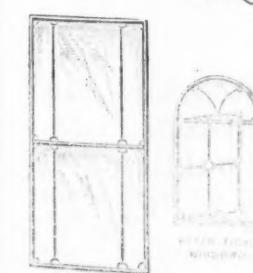
PATENTED IN

FRANCE,
GERMANY, AND BELGIUM.



CAN BE DESIGNED AND MANUFACTURED
TO SUIT ANY STYLE OF ARCHITECTURE
OR POSITION WHERE A WINDOW MAY BE
REQUIRED.

ARE BEING EXTENSIVELY USED IN—



Private Houses,
Parsonage Houses,
Farm Houses,

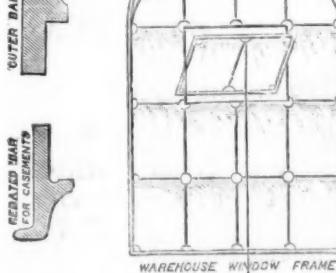
Churches,
Chapels,
Schools,



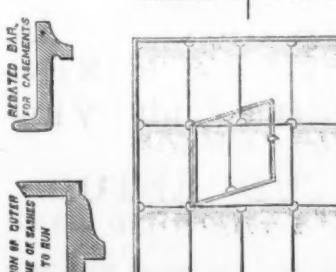
Lunatic Asylums, &c.,
Public Buildings, Banks,
Wharves, Warehouses,
Factories, Mills,
Breweries, &c.,
Engine Houses.



ILLUSTRATED CATALOGUES
ON APPLICATION.



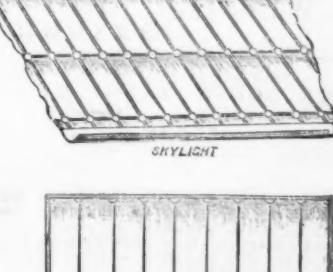
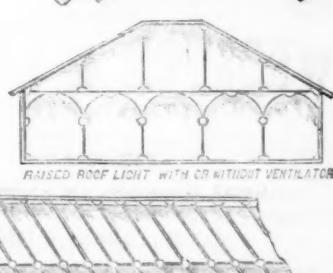
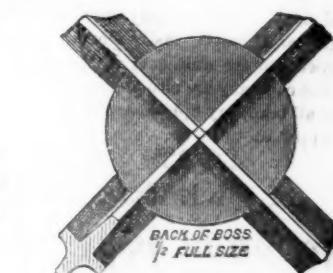
ILLUSTRATED CATALOGUES
ON APPLICATION.



Security is obtained in
these Skylights without
Guard Bars, and with less
obstruction to Light.



EXPORT.



SAFE, STRONG ROOM, AND PARTY WALL DOORS, AND EVERY KIND OF CONSTRUCTIONAL AND BUILDERS' IRONWORK, LIFTS, HOISTS, ELECTRIC BELLS AND TELEGRAPHHS, &c.
90, CANNON STREET, LONDON, E.C.; AND BEAUFORT IRONWORKS, BRISTOL.

H. R. MARSDEN will exhibit in full operation at the Manchester, Liverpool, and North Lancashire Show, at Lancaster, September 3rd to 5th, one of his

New patent Stone Breakers, with Screening Apparatus,

And on wheels to travel; also fitted with his NEW PATENT TOGGLE BEARING AND DRAWBACK MOTIONS, and REVERSIBLE PATENT FACED BACK CUBING JAWS in sections. Stones broken equal, and Ores better, than by hand, at one-tenth the cost.

H. R. MARSDEN,

ORIGINAL PATENTEE AND SOLE MAKER OF BLAKE'S

Improved Patent Stone Breakers & Ore Crushers.

New Patent Reversible Jaws,
in Sections, with Patent
Faced Backs.

NEW PATENT ADJUSTABLE
TOGGLES.

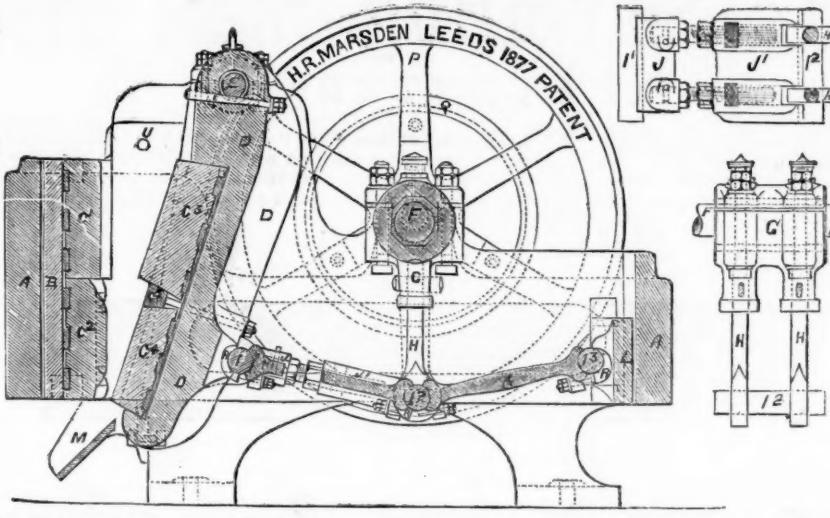
OVER 2500 IN USE.

New Patent Draw-back
Motion.

NEW PATENT STEEL TOGGLE BEARINGS.

70

PRIZE MEDALS.



READ THIS—

Wharhole Lime Works, Maryport, Whitehaven, November 7, 1873.

DEAR SIR.—The machine I have in use is one of the large size, 24 in. by 12 in. The quantity we are breaking daily with this one machine is 250 tons, the jaw being set to break to a size of 2½ in. We have, however, frequently broken over 300 tons per day of ten hours, and on several occasions over 350 tons during the same period. The stone we break is the blue mountain limestone, and is used as a flux in the various ironworks in this district. We have now had this machine in daily use for over two years without repairs of any kind, and have never had occasion to complain of any inconvenience in using the machine. I hope the one you are now making for me may do its work equally well. The cost—INCLUDING ENGINE-POWER, COALS, ENGINEER, FEEDING, and all EXPENSES OF EVERY KIND—is just 3d. per ton. Should any of your friends feel desirous of seeing one of your machines at work, I shall have much pleasure in showing the one alluded to.

I am, dear Sir, yours very tru y,

WILLIAM MILLER.

AND THIS—

Wharhole Lime Works, Aspatria, Cumberland, July 11th, 1878.

H. R. MARSDEN, Esq., Soho Foundry, Leeds.

DEAR SIR.—We are in receipt of your letter of 4th inst. I may just state that the stone breaker above named has been under my personal superintendence since its erection, and I have no hesitation in saying that it is as good now as it was five years ago.

I am, dear Sir, yours faithfully,

FRANCIS GOULD.

GREATLY REDUCED PRICES ON APPLICATION.

ALL BEARINGS are renewable, and made of H.R.M.'s Patent Compound ANTIFRICTION METAL.

CATALOGUES, TESTIMONIALS, &c.

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.

TO COLLIERY AND MINE OWNERS.

R. HUDSON'S PATENT STEEL CORVES OR "TRAMS."

Patented July, 1875, and January, 1877.

Entire new principle, saving three-quarters to 2 cwt. "dead" weight per corve. Will hold 2 to 3 cwt. more coal than the ordinary kind, without increasing the outside dimensions. Adopted by—
Messrs. THOMPSON, WISE, & Co., Burry Port, South Wales. | Messrs. BARING, GOULD, & ATKINSON, Diamond Fields, South Africa.
Messrs. DYNOMDS' Liveredge Coal Company, near Leeds. | Messrs. KIMBERLEY, Diamond Mines, South Africa.
Messrs. W. ACKROYD and BROS., Morley, near Leeds. | Mr. HASELDEN'S Lead Mines, Linares, Spain.
Messrs. CLAYTON and SPEIGHT, Farnley, near Leeds. | FRYSTON COLLIERY CO. (Limited), Castleford, near Leeds.
Messrs. JAS. WORMALL and SONS, Rawdon, near Leeds. | HOWDEN COUGH COLLIERY CO. (Limited), near Leeds.
KINGWOOD COAL and IRON CO., near Bristol. | MIDDLETON COLLIERY CO., near Castleford. | Messrs. RUSHFORTH and Co., Adwalton, near Leeds. | Messrs. JAS. FUSSELL, SONS, and Co., Frome, Somersetshire.
MIDDLETON COLLIERY CO., near Leeds. | NEWTON COLLIERY, near Castleford. | T. VAUGHAN and Co.'s TRUSTEES, South Medomsley Colliery; and others.
R. HUDSON, Engineer and Ironfounder, Gildersome Street Foundry, near Leeds (Five minutes walk from Gildersome Station, G.N.R.)

The Barrow Rock Drill COMPANY

Are NOW PREPARED to SUPPLY their DRILLS, the ONLY ONES that have been SUCCESSFULLY WORKED in the MINES of CORNWALL. At DOLCOATH MINE, in the HARDEST known ROCK, a SINGLE MACHINE has, since its introduction in July, 1878, driven MORE THAN THREE TIMES the SPEED of HAND LABOUR, and at TWENTY PER CENT. LESS COST PER FATHOM.

In ordinary ends two machines may be worked together, and at a proportionately increased speed. They are strong, light, and simple, easily worked, and adapted for ends and stopes, and the sinking of winzes and shafts.

The company are also prepared to SUPPLY COMPRESSORS, and all necessary appliances for working the said Drills.

Apply to—

LOAM AND SON,
LISKEARD, CORNWALL.

IMPROVED STEEL WIRE FOR ROPES.

WEBSTER & HORSFALL,

(ORIGINAL PATENTEE),

MANUFACTURERS OF IMPROVED STEEL WIRE FOR ROPES
FOR COLLIERIES,

RAILWAY INCLINES, PLOUGHES, HAWSERS, &c.

SOLE MANUFACTURERS of the HOMOGENEOUS WIRE for the
ATLANTIC CABLES of 1865 and 1866.

WEBSTER AND HORSFALL,
BIRMINGHAM.

THE GREAT ADVERTISING MEDIUM FOR WALES.

THE SOUTH WALES EVENING TELEGRAM
(DAILY), and

SOUTH WALES GAZETTE
(WEEKLY), established 1857.

the largest and most widely circulated papers in Monmouthshire and South Wales.

CHIEF OFFICES—NEWPORT, MON., and at CARDIFF.

The "Evening Telegram" is published daily, the first edition at Three P.M., the second edition at Five P.M. On Friday, the "Telegram" is combined with the "South Wales Weekly Gazette," and advertisements ordered for not less than six consecutive insertions will be inserted at an uniform charge in both papers.

P. O. O. and cheques payable to Henry Russell Evans, 14, Commercial-street, Newport, Monmouthshire.

THE IRON AND COAL TRADES' REVIEW.

The IRON AND COAL TRADES' REVIEW is extensively circulated amongst the Iron Producers, Manufacturers, and Consumers, Coalowners, &c., in all the iron and coal districts.

It is, therefore, one of the leading organs for advertising every

description of Iron Manufactures, Machinery, New Inventions, and all matters relating to the iron, coal, hardware, engineering, and metal trades in general.

Offices of the Review: 7, Westminster Chambers, S.W.

R.mittances payable to W. T. Pringle.

THE "CHAMPION" ROCK BORER

MINE AND QUARRY STANDS, STEEL DRILLS, SPECIALLY PREPARED INDIARUBBER HOSE, TESTED
IRON PIPES, &c.

Air-Compressing Machinery,

Simple, strong, and giving most excellent results, and

ELECTRIC BLASTING APPARATUS.

Full particulars of rapid and economical work effected
by this machinery, on application.

CONTRACTS TAKEN, OR SPECIAL TERMS FOR HIRE.

ULLATHORNE AND CO.,
Mechanical and Consulting Engineers,
63, QUEEN VICTORIA STREET, LONDON, E.C.

THE ROANHEAD ROCK DRILL.

BY ROYAL LETTERS PATENT.

This justly-celebrated Rock Drill, the only one invented that will work in the hardest rock without more than the usual repairs required by any ordinary machinery, is now offered to the public.

It has been most successfully worked in the well-known Hematite Mines of Lancashire and Cumberland. Will drive 50 to 60 ft. in hard rock without change of drill, and can be worked by any miner, and kept in repair by any blacksmith. It is the most simple rock drill ever invented, and cannot with fair usage get out of order.

Plans, Estimates, including Compressors, and all other Mining Machinery, supplied on application to the sole makers,—

SALMON, BARNES, AND CO., MINING ENGINEERS.

Canal Head Foundry and Engineering Works, Ulverston.

J. WOOD ASTON AND CO., STOURBRIDGE

(WORKS AND OFFICES ADJOINING CRADLEY STATION),

Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES
FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS,

RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions.

STOURBRIDGE FIRE BRICKS AND CLAY.